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THE IMPORTANCE OF A ROENTGEN RAY EXAMINATION OF THE KIDNEY IN CASE OF PAIN IN THE UPPER RIGHT ABDOMINAL QUADRANT*

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The importance of making a Roentgen ray examination of the kidney in case of pain in the right upper abdominal quadrant was impressed upon me by a statistical survey of a large number of these cases which showed that more than 30 per cent of our patients in whom a definite pathological condition of the right kidney was discovered had previously undergone operations for some condition unrelated to the kidney, such as an ulcer of the stomach, gall-bladder disease, or appendicitis; and the subsequent history indicated that in many of these cases the symptoms had not been relieved.

I do not wish you to infer from the above statement that in many of these cases the surgical treatment was not fully justified by the presence of a definite pathological condition in the stomach, the gall-bladder, the appendix, or elsewhere. However, the fact that in such a large percentage as that cited above, the kidney was either entirely or in part responsible for the symptoms, indicates that in a case of pain in the upper right abdominal quadrant an exploratory operation is not justifiable until a roentgenological examination of the right kidney has been made, to discover whether or not that organ may be wholly or in part responsible for the pain. It it true that many patients may feel that they are financially unable to have a complete examination. On the other hand, hospital bills and surgical fees constitute a heavier financial budren, especially if the primary operation does not give the hoped-for relief. With the diagnostic measures now at our command every patient with pain or any other symptoms referable to the upper right abdominal quadrant has the right to demand and should demand an accurate diagnosis.

In any case of pain in the upper right abdominal quadrant the examining physician and the roentgenologist should have in mind the various lesions to which pain in this region may be due:—lesions of the spine, gall-bladder disease, ulcer of the pyloric end of the stomach or of the duodenum, carcinoma of the stomach, appendicitis, kidney lesions, subdiaphragmatic pleurisy, chronic duodenal ileus, angina pectoris, carcinoma of the colon, adhesions, gastroptosis.

Most of the conditions cited above present a rather characteristic clinical picture. In case

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of a lesion of the spine the Roentgen ray examination is easily made. Duodenal or gastric ulcer is usually accompanied by a characteristic chain of symptoms, and the same may be said of carcinoma of the colon. If the diagnosis suggested by the symptoms is confirmed by a gastroenterological x ray examination no further investigation need be made. On the other hand, if the diagnosis is not fairly clear, then it should be determined whether or not the right kidney and ureter are normal before the patient is subjected either to a long-continued treatment with inconvenient dietary regimen—in the case of ulcer, or to an abdominal operation.

In the case of gall-bladder lesions the differential diagnosis may be more difficult, although, of course there are cases which present a rather typical chain of symptoms. In such cases the attack of pain usually comes on suddenly and acutely, radiates to the back and sometimes to the shoulders and down the right arm,

Fig. 1.—Pyelogram of right kidney showing a dilated pelvis and a dilated upper calix. The caudal calix is obliterated and the outer edge of the pelvic shadow is encroached upon by a mass which is probably a tumor of the kidney. This patient had had a herniorrhaphy three years before. In this case the predominant symptom —hematuria—indicated at once a pathological condition in the right kidney, this indication being confirmed by the pyelogram. At operation a papillary carcinoma of the right kidney with metastasis in the right ureter was discovered.

Fig. 2.—Pyelogram of left kidney showing dilated pelvis which looks like a hydronephrosis. At operation a large stone was found in the left pelvis. This patient had had pain in the left side and back for a year, the nature of the pain suggesting the possibility of some pathological condition of the spine X ray examination showed the presence of hypertrophic arthritis, more marked in the *right* side, with a large irregular calcification which was at first thought to be a calcified gland. This shows the importance of extending examination in such a case to both kidneys.

Fig. 3.—Pyelogram showing calculi in lower right ureter producing obstruction and dilatation of the ureter above the stones. This patient complained of diffuse, dull aching pain on the right side with sharp pains radiating down to the groins and into the scrotum, these attacks lasting one or two days and being accompanied by nausea and vomiting. The pain suggested cholecystitis and a primary x ray examination of the gall-bladder region was made. This showed that the source of the pain apparently was not in the gall-bladder, and the subsequent kidney examination betrayed the real condition.

is accompanied by vomiting, and is sometimes followed by jaundice; the patient is usually in the middle decade of life, is frequently a rather stout female, and gives a history of indigestion accompanied by gas in the gastro-intestinal tract. But unfortunately many cases do not present such a typical history. There are frequently missing links in this chain of symptoms, such as absence of the gastric disturbance in the interval between the attacks of pain. In such cases the diagnosis may be aided by the time the appearance of the pain, that is, whether it appears to be influenced by the ingestion of food, but even so, if the typical clinical picture of gall-bladder disease is not present then certainly the kidney should be examined before the diagnosis is made.

The symptoms presented by chronic inflammation in a retrocecal appendix with recurrent acute attacks may be simulated by renal disease and in such cases, even if the surgeon suspects that the symptoms are due to the appendix, he shold make sure before operating that some lesion of the kidney is not a contributing factor.

In contra-distinction to most of the conditions which we have cited above, diseases of the kidney itself do not usually give a very clear-cut chain of clinical symptoms, and x ray examination is required for their identification. The study of the kidney is best carried out by first making a pair of stereoscopic kidney films from which the size, shape, and position of the right kidney may be determined, together with the presence or absence of

Fig. 4.—Pyelogram of the right kidney showing a dilated ureter and a dilated kidney pelvis, the obstruction causing the dilatation being about at the level of the middle of the sacrum. This patient had had attacks of pain for four or five years, so severe that at times he had had to have hypodermic injections. In this case the history seemed to be definitely that of renal colic and this suspicion was confirmed by the x ray and the cystoscopic examinations.

suspicious shadows in the region of the kidney or ureter. It should be noted that the presence of a large right kidney should not of itself alone be considered evidence that the kidney is diseased. The enlargement may be entirely due to an hypertrophy compensating for a diseased kidney on the left side. The absence of suspicious shadows in the right kidney or ur-

Fig. 5.—Pyelogram of right kidney showing three large stones in the right kidney pelvis, which was dilated. At operation two stones were removed from the right pelvis and one from the calix. This patient had had an operation for gall-stones nine years before. She came in because of pain in the *left* lumbar region, occasionally so severe as to require morphin. There was some evidence of stricture in the *left* ureter. The gall-bladder plate showed no evidence of a pathological condition of the gall-bladder.

Fig. 6.—Pyelogram showing a large tumor mass which has the appearance of a cyst occupying the lower pole of the kidney; the kidney pelvis and calyces are rotated, carrying the true pelvis upward. The pelvis is rather large and the caudal calix is also somewhat enlarged, indicating improper drainage. A diagnosis of tumor of the right kidney was made and was confirmed at operation when a hydronephroma was removed. This patient had had attacks of pain in the right side for two years with occasional hematuria.

eter should not be interpreted as definitely ruling out the presence of a stone. If ureteral catheterization on the right side shows red blood cells or pus in the specimen, a pyelo-ureterogram of the kidney and ureter should be made, in order definitely to determine the presence or absence of a calculus. If a stone is present which was not shown in the primary examination, the pyelo-ureterogram will reveal a shadow of darker hue than the shadow produced by the pyelographic medium, a shadow resembling very closely that of a pure cholesterin gall-stone after the administration of tetraiodophenolphthalein. We have found such stones as these in less than five per cent of our series. The pyelogram may reveal the presence of hydronephrosis, which will be evidenced on the x ray film by dilatation of the kidney pelvis or calices, or only one calix may be dilated, showing that the hydronephrosis is localized within the kidney; or the ureter may be dilated, showing that the obstruction lies somewhere in its course, such an obstruction being due to a stone or a stricture, to some extrinsic cause, to the position of the ureter, or in a case of nephroptosis to the position of the kidney. If the obstruction appears to lie in the ureteropelvic juction then the possibility that it is due to an aberrant blood-vessel should be considered. Special emphasis should be placed upon the importance of those obstructions within the right

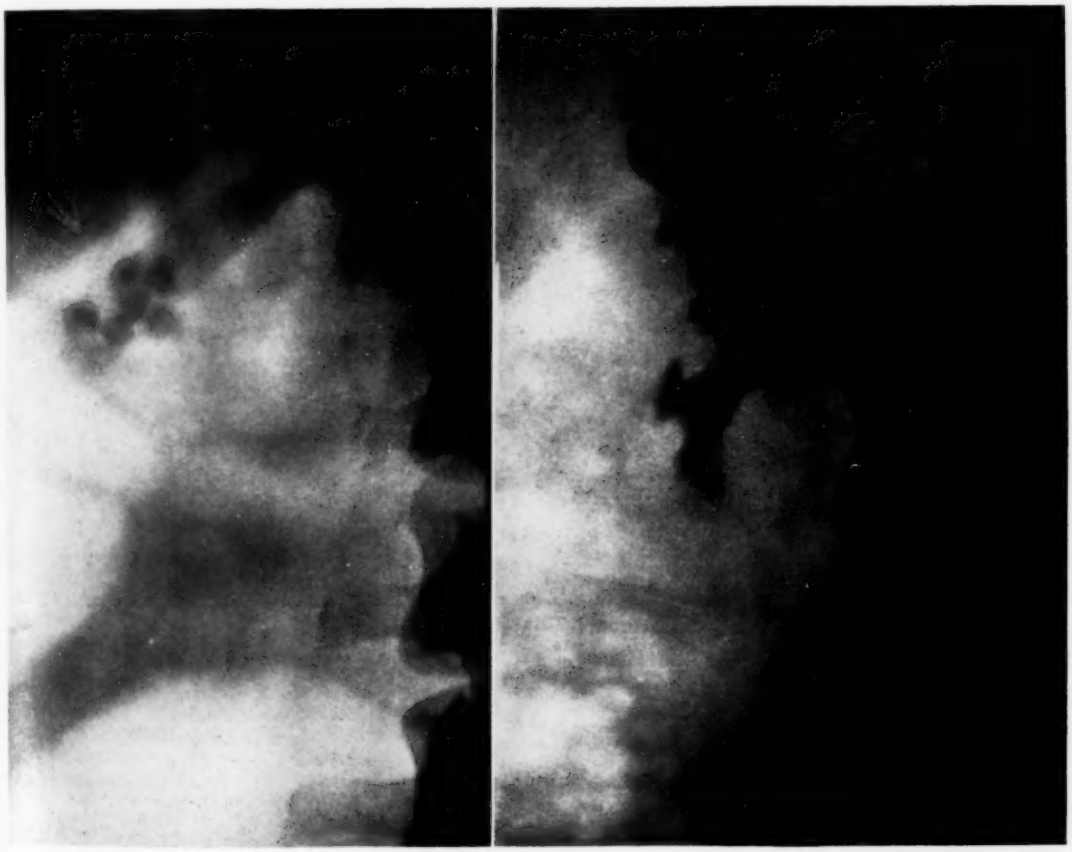

Fig. 7.—(A) Gall-bladder plate showing six stones in a cluster in the region of the gall-bladder. (B) Pyelogram showing hydronephrosis in one of the upper calyces of the right kidney. The assumption that this was the location of the stones was confirmed at operation.

kidney or ureter which cause an intermittent hydronephrosis, as lesions of this type cause pain in the upper right abdomen which most closely resembles the pain of gall-stone colic. A stone or a group of stones in the calix of a kidney may obstruct the infundibulum and produce periodic attacks of pain which very closely simulate that experienced by a patient suffering from cholelithiasis. Stone in the pelvis of the kidney or in the ureter may at any time produce an obstruction with resultant hydronephrosis and pain.

A patient with a floating or movable kidney will have periodic attacks of pain due to the intermittent obstruction of the ureter, this pain in particular closely simulating that produced by gall-stones. The characteristic symptom produced by a low-lying anomalous kidney is frequent, intermittent pain in the region we are discussing.

Stricture of the ureter also may produce periodic obstruction, with a resultant distended kidney pelvis or ureter, and pain. We have seen cases of gastroptosis in which a fixed, low-lying kidney has been compressed by the liver to such an extent as to produce definite pain in the upper right abdominal quadrant. Pyonephrosis, or a malignant tumor, may cause upper right abdominal pain. On the other hand, benign growths of the kidney, such as solitary cysts, are usually not accompanied by pain. The pyelogram may sometimes disclose the presence of a pyonephritic abscess, the fistulous tract of which

Fig. 8.—Pyelogram showing enlarged right kidney with large pelvis, irregular in outline. This together with the evidence gained from catheterization of the ureters and the physical examination and history justify the diagnosis of pyonephrosis of the right kidney.

Fig. 9.—Pyelogram showing a suspicious shadow apparently in the ureter, the catheter not passing beyond this point. This patient had had pain in the right side for five years, no attack of colic, no hematuria, no pus in the urine, no frequency, no pain or burning on urination. The diagnosis of ureteral stone was confirmed at operation when the stone was removed.

Fig. 10.—Pyelogram showing a possible hydronephrosis with areas of lesser density in the pelvis of the right kidney. This might indicate the presence of a growth, a blood clot or a stone. At operation a large renal calculus about one inch in diameter was removed from the pelvis. This patient had had attacks of pain in the right side for over a year and had been treated for rheumatism and sciatica. The presence of blood and pus in the urine led to the suspicion that the condition was due to some pathological condition of the kidney or ureter.

leads from the abscess into the kidney pelvis or ureter.

The roentgenological diagnosis of these conditions in the kidney can best be demonstrated by means of films or lantern slides of films illustrating the types of cases which I have enumerated, but before showing these I wish again to make a plea that the kidney be studied in all cases in which there is any question as to the cause of pain in the upper right abdominal quadrant. The technique of roentgenographic studies of the kidneys and ureters is simple and carries with it no particular risk to the patient, the findings are quite definite and in most instances present information on which a definite diagnosis can be based. This being the case, no patient should be submitted to an exploratory operation until at least an attempt has been made to rule out the possibility that some pathological condition is present in the right kidney or ureter.

Discussion

Dr. Carl Beck (Chicago, Ill.): Dr. Nichols has presented a very timely and a very useful paper and has illustrated it amply and very efficiently with his pictures. It is the question of pain on the right side.

Fortunately the time is passing very quickly, although it isn't here yet, when a little tapping on the right side in case of pain makes a diagnosis which has created the facetious term of right siditis and led to the operation of the removal of the appendix or the gall-bladder.

We have to thank the roentgenologist particularly for the improvement in this respect of having placed the diagnosis on a truly scientific basis. That is what we see and we cannot deny it, at least if our eyes and our brains are in good health.

The importance of this paper lies in the fact that the right side particularly, although the left kidney is also affected by the same lesion, but the right side is particularly often overlooked because the gall-bladder and the appendix are so commonly diseased. The differential diagnosis does not extend only to the gall-bladder and to the appendix. There is the pancreas. There are the lesions alluded to and that was the very rare or comparatively rare distention of the duodenum. I happened to be present when the essayist showed a case two or three years ago in the clinic in Cleveland and while his diagnosis had been so excellently proven on the operating table in the presence of Dr. Wilkie and numerous other men, to the great satisfaction of all of us, he has shown to us how important it is to make good pictures and good observation under the fluoroscope.

If that is not the case then of course we jump to the conclusion of a diagnosis and base upon that an operation, an operation which may be entirely useless or even dangerous and fraught with bad after effects.

Now, as to going a little closer into the discussion of his demonstrations, he has all the main pathological conditions illustrated there that come into question. Lately there has been added to the diagnosis of the kidney, and I am sure he is also familiar with it, a matter which I think in extereme cases could be used and ought to be used and that is the pneumokidney. The pneumokidney is a little different from the pneumoperitoneum although it is on the same basis. It is the introduction of oxygen or other gas into the space around the kidney which outlines the kidney just as well as the gall-bladder is outlined, or as the uterus or the liver is outlined. This method in most cases is absolutely harmless unless it is done with a false technic.

In cases of hydronephrosis where it does not distinguish itself very much from the surrounding tissues, it is clearly outlined and I think the doctor will perhaps in his closing discussion tell his experiences. Dr. Orndoff has used this in a comparatively large number of cases not only in the right kidney but also in the left kidney. There was a very great outline in cases in which we were not able to make an exact diagnosis without it.

Let me once more congratulate the doctor particularly on the demonstration of the possibilities of x ray regarding the stones. Those who have had a chance to observe the results of pictures will agree with me that they are exceptionally good.

Dr. Gustav Kolischer (Chicago, Ill.) There are cases where the x ray picture doesn't give any information at all. For instance, it will happen that we have a patient who complains about renal colic. The x ray picture doesn't show any deformity of the pelvis. The x ray doesn't show deformities of the kidney. In all the cases as we exclude something else there is a test that is very valuable. If we are able to produce artificially such renal colic when we think of adhesions at the pelvic junction. If you get such a person let the patient drink 100 c. c. of tea. Then a renal colic occurs. Al-

though the x ray finding is negative you can be pretty sure that there is an adhesion and that it is obstructing the ureter at the junction of the pelvis.

It will happen in the roentgenogram that you can't make the decision where you have to deal with the condition within the ureter. It will happen that the ureter stone is caught. Then there is the distance between the shadow of the stone and the shadow of the catheter.

There is a method to ascertain definitely whether the calculus is within the ureter or outside. If you inject a silver solution, for instance, neosilvol, and take your picture, then let the patient go for twenty-four hours and then take another picture, if the shadow is accentuated then it means that the silver solution has precipitated onto the stone. These cases are not so very infrequent.

I would like to call the attention to the x ray pictures especially if you have filled the ureter at the pelvis, so-called ureterography. Except for congenital malformations, double pyelograph is much overrated. There is no absolute characteristics for any special pathology. A distortion of the pelvis may be produced by tumor, or by a perinephritis. There are no characteristics that lead to conclusive diagnosis of disease. Further more, the size and resistance of the pelvis is an individual affair . Quite often the distention isn't made by a dilated pelvis and dilated calix.

You will find absolutely normal kidneys. It is possible to inject fifteen, twenty, twenty-five c. c. of any fluid without any complaint from the patient. With the pyelograms we have to be very careful. Pyelograms are of value only if they are combined with all the other methods of examination among which the highly important one is to test the function of the kidney. If you haven't got this item you cannot make a diagnosis. More and more nowadays, even in general surgery, the surgeons have recognized the importance of testing the kidneys and we may lay down this rule now: No patient should be admitted to an operation who didn't undergo testing of his blood chemistry. If there are changes in the blood chemistry that calls to our attention that there is a disturbance in the elimination and we have to investigate it. If we have to deal with our so-called hydronephrosis quite often there may nothing appear in the urine that is decisive, no blood because of the vascula of the kidney together with the x ray picture furnishes the diagnosis.

Now, if we have an appendicitis together with blood in the urine and reduced function then we know we have a combination of conditions in both. The great value of the x ray picture lies in that, that it calls our attention to the possibilities and to pathology in the kidney, congenital malformation, giving us decisive and correct information, and quite often simply by basing our diagnosis on a picture we are misleading diagnosticians and subsequent operators.

Dr. Reuben Lavine (Oswego, N. Y.): It must be remembered that we cannot absolutely depend on shadow for stones in the x ray, for not all stones cast a shadow on the x ray. I have special reference to uric acid. They are not demonstrable on an x ray picture and you have to, by other means, make a diagnosis.

Dr. Bernard Nichols (Cleveland, Ohio): I think I brought out in the paper the fact that stones that do not cast a shadow on the plain plate can be shown by taking a ureterogram or pyelogram. I showed one case in which the stone was in the pelvis of the kidney but did not show on the plain plate.

As to the value of pyelography, I think perhaps Dr. Kolischer is perfectly right in saying that it has been overestimated, and there are undoubtedly errors in interpretation. It is impossible to go into all the clinical details in a short paper. We do investigate all the clinical symptoms, determine the function of the kidney, examine the urine and consider the history of duration of the symptoms, in addition to making the x ray plate; but we are perfectly frank in stating that we believe that we can diagnose many lesions by means of pyelograms, particularly tumors and hydronephrosis, a fact which is supported day after day at operations. To be perfectly frank, however, I grant that in many early cases of lesions in the kidney there is a chance for error.

At the time the pyelograms are made we always know whether the patient experiences pain and that is the guide to the distensibility of the pelvis and calices. If the patient has pain at the examination we have a right to believe that the kidney is undoubtedly the source of the patient's symptoms.

We have not made air injections of the kidney. It has been done and it is a very valuable method, but I think that at the present time in the vast majority of cases the stereoscopic films give a sufficiently good outline of the kidney to determine such irregularities as indicate the presence of tumor.

PHYSICAL THERAPY IN THE TREATMENT OF ATHLETIC INJURIES*

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The present wide spread participation in athletics gives rise each year to a considerable group of injuries requiring special treatment. The recovery of the patients in this group is favored by the fact that most of them are young, in fine general condition and seldom the subject of focal infection. Satisfactory treatment is rendered difficult, on the other hand, for the reason that both the athlete and the coach insistently demand the earliest possible return to strenuous competition. Further-more, instead of following the patient through to maximum improvement, as is the case with the injured worker under the compensation laws, interest and financial support of the player are apt to cease, if he is too badly injured to return to play before the last of the season, or if his injury occurs at that time. The tremendous gate receipts from most athletic contests in these days, should not only justify the most skilled and adequate treatment, but each case should be followed to maximum improvement. Cessation of treatment before this stage tends to the liability of re-injury, or to the development of chronic weakness which may be a handicap to the individual for the remainder of his life.

The writer is thoroughly familiar with the plan of treatment in vogue only with the Yale, Harvard, Princeton and Annapolis teams during the past few years, but the value of adquate treatment of athletic injuries has been conclusively demonstrated with many other teams. The types of injury most frequently met with are muscle contusions; joint sprains; torn muscle insertions; tenosynovitis and subperiosteal hematoma.

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Muscle Contusions: These are by far the most common of athletic injuries, especially in football where the shoulder of the tackler strikes the anterior muscles of the thigh of his opponent, and in many similar conditions. The severity of the injury will depend upon the "condition" of the player and the force of the blow received. The pathology may range from a slight bruising of the superficial or the deep fibres, to a sever contusion with extensive extravasation of blood and lymph within the muscle sheath. The early conservative treatment advised, twenty-four hours rest followed by superficial heat in the form of radiant light, whirlpool bath, paraffin bath or steam towels together with gentle massage, has been modified somewhat by the experience of Dr. M. Hines Roberts at Annapolis. Distinctly better results in the majority of his cases were obtained by the employment of diathermy and sinusoidal, immediately after injury. A less painful and even more efficient method of decongesting, there-by preventing organizing of exudate and transudate, would be by substituting the Morton wave for sinusoidal. Being entirely a passive contraction this is much less painful to the injured muscle. When the case is first seen several days after the injury, prolonged diathermy, thirty to forty-five minutes, followed by Morton wave is indicated.

Joint Sprains: Sprains are exceedingly common in athletic injuries. The baseball finger is usually badly dislocated which must be set and should be followed by paraffin bath, or whirlpool bath, saline and cuff diathermy, and static brush. When the latter is not available, gentle longitudinal and circular effleurage followed by alternate finger-tip pinching is the massage procedure of choice. In the case of the shoulder, a relatively large degree of functional disability

often follows a comparatively slight injury. The use of radiant heat, direct diathermy and static sparks will usually obtain a surprising degree of functional return. Where the capsule of the joint is torn an edequate fixation harness, or operative repair must be coupled with prolonged and thorough treatment.

In the common injuries of the knee joint, external and internal lateral sprains may be treated as outlined for the shoulder. In a synovitis with much effusion, direct diathermy followed by static Morton wave applied by means of an inverted U-shaped electrode excluding the patella is advised. The treatment of internal semilunar cartilage dislocation is usually unsatisfactory in the absence of a hinge-cage brace to prevent recurrence. Tears in the crucial ligaments also require fixation apparatus and prolonged rest with diathermy. Hemorrhagic infusion into the joint should be aspirated. Treatment by diathermy alone is unsatisfactory in these cases. In sprains of the ankle the ligament should be relaxed by means of a lift on the heel, a flat root or reversed flat foot strapping, and used slightly from the first. Paraffin or whirl pool bath, direct diathermy and static brush and sparks are valuable aids in recovery. In long standing chronic sprains we find galvanism of value.

Tenosynovitis: Tenosynovitis is most common in Achilles tendon. It is treated by some of the forms of external heat already mentioned, modified diathermy, static brush and effleurage coupled with rest in the acute stage. Every effort must be made to remove exudate before it has a chance to organize. Torn muscle insertion demands relaxation of the muscle, often with the assistance of sand bags, and an effort to improve the circulation by means of superficial heat and diathermy.

Subperiosteal Hematoma: This is the real "Charlie Horse" for which the muscle bruise is often mistaken. The absorption of the clot may be augmented by the use of diathermy after the tendency to hemorrhage has stopped. After several days, massage if superficial or Morton wave if injury is deep lying, may be used.

An adequate understanding of the physics and physiological effects of the various phases of physiotherapy employed will bring to mind many modifications of the simple technique outlined. Certainly no treatment should be instituted without such an understanding of the proper type, its use and technique of application. The manipulation of the athletic teams "rubber" should not be permitted where there is any possibility of serious injury. It is believed that these injuries are sufficiently common and hold the possibility of becoming so serious a handicap in the lives of these patients as to challenge our thoughtful consideration and concentrated efforts toward their alleviation.

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THE PHYSICAL AND CHEMICAL THERAPY OF NEURAL SYPHILIS*

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Syphilis, like the poor, is always with us. Its manifestations are protein. Its symptomology is co-incident with every function and tissue of the human body. "Age can not wither it nor yet stale its infinite variety." It may scourge the entire body but it reaches its maximum in its attack upon the central nervous system. It may be cured. Of this, there is never any certainty. This uncertainty is so great that we may with a large modicum of truth proclaim that *syphilis never dies, it sleeps.* Anti-syphilitic chemical remedies, mercury, arsenic and bismuth are all heavy metals, with large molecules, that have great difficulty in penetrating into the nervous tissue. It therefore becomes extremely important to utilize any remedies or combination of remedies that will render the central nervous system more susceptible to the action of medicaments and permit of the entrance of these drugs into the walled off structures of the nervous system. It therefore is important to search and strive for any means or measures that will aid or improve the present methods of treatment.

The following method has proved so satisfactory in a large number of cases that it is put forward as a means of reaching these most difficult diseases. It is not a new remedy or a new method, but a combination of old methods, well known and tried, into a form or system of treatment, the sequence of which is important. The system employs proper diet, rest, the administration of medicines by mouth, fresh air, reasonable exercise and sunlight

Hydrotherapy or the use of water, by special methods is most important The patient is given mercury, bismuth, and arsenic, and especially after the use of glucose and salvarsan, the brain is heated by means of diathermy or electrothermal heating to the region affected, and this in turn is followed by the use of galvanism (the direct electric current). The arsenate or salvarsan is given intravenously, but is preceded by the use of a solution of glucose. Immediately following the salvarsan the electrical treatments to the brain, cord or nerve roots is applied. This method of treatment seems to open the nervous system to the action of specific drugs. A treatment of syphilis and neural syphilis in particular is not by any means confined to chemo-therapy. It is this narrow and limited view that a chemical (drug) or chemicals can accomplish the wonders of Aladin's Lamp that is the physician's undoing oftentimes. *Per contra,* I do not believe that any case of syphilis can be properly handled without chemicals. It is the intelligent combination of all known measures that often gives brilliant results in cases that appear almost hopeless, particularly where the patient is treated and not the syphilis alone.

The increase of resistance, the relief of focal infection, the change of psychic attitude, all count in these cases. The essentials of this treatment are:

1. Proper diet, rest, and the administration by mouth of tonics, digestants or other medication as demanded.

2. Fresh air and reasonable exercise in ambulant patients and the Fraenkel method of re-education in those that demand its use.

3. Hydrotherapy daily.

4. Diathermy and galvanism daily.

5. Administration of mercury and bismuth hypodermatically.

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6. Administration of dextrose intravenously.

7. Administration of the arsenicals intravenously.

8. Adjuvant measures such as actinic air cooled light, static electricity, etc.

Metabolism: Specific cases should be well fed. The maintenance of nutrition is one of the most important features in the treatment of this disease in any of its forms. Many of these cases are anemic, some are cachexic and demand not only food but tonics that stimulate vitaminic activity. Two drugs have been found to aid diet materially and these are iodine and cod liver oil. These in conjunction with fresh air, reasonable exercise and the use of actinic air cooled light several times a week, will materially aid in the reconstruction of the metabolism of the patient.

Hydrotherapy: One could well spend the entire time at his disposal upon the value of hydrology in the treatment of lues. It has no direct specific or antiseptic value. Its power to regenerate, to stimulate all the functions of the human body, to burn up waste material, to eliminate its ashes, to increase neural and muscular power are the daily observances of those who use it constantly and depend upon it for results that it rarely fails to attain.

Diathermy: The medical profession has for many decades recognized the curative value of heat. The febrile manifestations of infections creating heat within the tissues of the body, limits and eventually destroys the infection. In like manner diathermy induces heat within the tissues themselves and is the only current of electric energy that it capable of so doing. This is brought about by a peculiar molecular disturbance, and oscillatory, mechanistic, frictional disturbance in the electrons, atoms or molecules, with the result that heat, and seemingly heat alone, is produced without chemical or electrolytic decomposition. The explanation of this lies in its oscillatory action and its lack of polarity. Following the publication by De Kraft and Titus of their use of diathermy and galvanism a number of years ago, I have used this method very extensively in the treatment of disturbances of the central nervous system and diseases and disorders of internal medicine. I have found diathermy of particular and peculiar value as a measure capable of preparing and as it were sensitizing the brain and nervous system to the action of the galvanic current. I use much larger doses (300 to 500 or 600 milliamperes) to the brain than these gentlemen suggested, a longer treatment (10 to 15 minutes) and my not inconsiderable experience has justified me in this belief.

Galvanism: Preceded by diathermy, galvanism is very much more efficient than when used alone. I have from a wide *clinical experience* definitely settled the rule that the negative pole should be placed as near as possible to the site of the lesion. The reason for this probably is that there is a greater flow of blood in this direction, the tissues are rendered softer and more succulent, and there is increased secretion. From the results obtained I am inclined to not only believe that the medicaments introduced into the circulation in the treatment are enhanced in their activity by the combined use of diathermy and galvanism but I believe that the nervous system is rendered much more accessible to chemical treatment. Of this I have no proof, unless clinical results are proof. No matter what may be the theories underlying their action, clinically it remains a fact, that where these currents are applied in sufficient doses, for a sufficient length of time, the chemotherapy of syphilis, especially as relates to the central nervous system, is greatly enhanced.

The static current as an adjuvant may be employed in the shape of direct or indirect heavy sparks to spine, and extremities, followed by *the wave current* preferably using two very large Leyden jar condensers, to obtain the heaviest

spark and the most pronounced vibratory wave. It may be used to relieve pains, anesthesia and for its general toning effect. In cases that are markedly run down, we may employ the *actinic air cooled lamp* two or three times weekly.

Dextrose: Intravenous sugar ($C_6H_{12}O_6$) solutions were employed in therapy by Buedingen. His observations were soon confirmed by others. So far as I know Herb in this country was the first to call attention to the value of these solutions in the treatment of acute general syphilis. He calls attention to the fact that the reason for the failure of antiremedies to reach the tissues and hence the treponemata is due to the fact that these tissues are edemetous and that in such tissues the organisms remain alive, increase enormously and multiply undisturbed. The edema acts as a mechanical barrier against adverse influences, directed against the organisms. He calls attention to the fact that whereever microbes settle, split products form and accumulate in the surrounding fluid. "Whether these split products originate from the hosts own tissues in consequence of the destruction wrought by the microbes, or from the disintegration of the dead microbes themselves they destroy or fix complement. Complement, without which ferments cannot work, is fixed at the outskirts of these zones, as soon as it arrives with the blood stream, so that ferments should they attain the treponemata, are inhibited in their action, and perfectly harmless to the enemy. Such edemetous zones I have designated "Zones of Inhibition". When fully developed they constitute a veritable fortress from which the treponemata cannot be dislodged, neither by the defensive mechanism of the body nor by the ordinary treatment even if it is persistent and intensive."

To reach these microbes and to make them accessible to our remedies we must first, drain the edematous fluid and destroy the fortress. Victor C. Vaughan found that all products formed during the disentegration or splitting of protein were acid in reaction. Thus a tissue acidosis is produced. Martin H. Fischer laid the foundation for the understanding of this problem, when he showed that this local acidosis caused the tissues to swell, infiltrate and gradually develop into "zones of inhibition". Herb comes to the conclusions that from a therapeutic standpoint the active reactions of the tissues to a leutic infection are first cellular and that in this reaction nature is capable of handling the invasion and the tissue usually frees itself; and second, there is a sphere of non-cellular reaction accompanied by localized acidosis, edema and protection of the growing treponemata by the edematous wall. To reach them we must first drain away the edema. This is done by the hypertonic dextrose solution. Herb is in doubt and states that it is undetermined whether it is best to administer the sugar before or after or in conjunction with the neoarsphenamine. From *clinical study* I feel satisfied that *the sugar solution should first be* administered and that an appreciable interval should be allowed between its use and that of the arsenical. Furthermore the use of heat in the diathermy, the use of galvanism, with its chemical influences, directly as possible to the affected area, seems to render the inaccessible tissues of the central nervous system more capable of access to the chemicals administered, that is to say the treponematacides.

Method of Administration: Early in morning administer 20 to 40 c. c. of sterile dextrose solution. Allow several hours to intervene and on an empty stomach administer the salvarsan or neosalvarsan intravenously.

Immediately following the last intravenous administration give *diathermy* to the brain, cord, cerebro-spinal or radices, such application depending upon the localization of the disease. Dose 300 to 600 milliamperes for 5 to 15 minutes *immediately* following this with *galvanism*. This is applied to the same proportions or all of the central nervous system, dosage 10 to 15 milliamperes for five to ten min-

utes placing the *active negative* electrode as near the sight of the lesion as possible and the positive indifferent electrode in such a position that the current will as nearly as possible pass directly through the involved tissues. This is to be administered as above immediately after the salvarsans and diathermy. On the other four days of the week the diathermy-galvanism is to be given without the glucose or salvarsan.

Chemotherapy

The writer does not believe that any form of treatment is of value, unless the so-called specifics against syphilis are employed. In a great many instances their use alone, intensively backed by intelligent guidance will bring about a *control* of the disease and a relief of its symptom pathology. Three remedies have been used in the chemical treatment of lues in this scheme of treatment. They are mercury, bismuth, and arsenic.

Mercury: The writer is still of the opinion that mercury is the sheet anchor in every form of syphilis. It has long held its place as a treponematacide and in his humble opinion it is not likely to be finally displaced. He employs various forms of mercury depending upon the case. The red iodide of mercury has proved in his hand to be a most satisfactory mercurial. It should be used in gradually increasing doses and pushed to its physiological limit.

Bismuth: A number of preparations are on the market but the writer prefers a soluble or colloidal preparation of bismuth. These preparations seem to be more effective, less painful and more easily handled. Bismuth has a rather slow but powerful action, tending to cicatrize lesions and heal them rapidly. It is especially valuable in neural syphilis and should be the drug of selection in headaches, convulsions and neuro-syphilitic pains, and acute meningitis. Wassermann-fast cases that have been treated extensively with arsenic and mercury oftentimes yield nicely to the addition of bismuth to the treatment. It seems to be especially valuable in latent lues and luetism, particularly those cases that have had previous intensive treatment with arsenic and mercury, especially relieving the pains, and while it is much slower in action than arsenic and mercury, both clinically and serologically once it takes effect, its action is more prolonged and serological tests seem to indicate that negatives are obtained for a longer time. It may be used with the salvarsans.

Arsenic: The various forms of salvarsan or arsphenamine should always be employed with care and caution in the treatment of neural spyhilis . It is my opinion that the cases under consideration are more subject to reactions than the general run of luetics. It has also been my observation that if results can be obtained with smaller doses of salvarsans and with larger doses of mercury and bismuth, the beneficial results last longer and are more pronounced. We usually follow the plan in my clinic and hospital of injecting very slowly, mixing the arsenic with the blood, believing that in this wey better results will be obtained. The patient should rest for a short while after receiving the intravenous adminisration and should take no food for at least two to three hours. While we employ gradually increasing doses, still we have found that in this method of treatment, where very large doses more frequently repeated have failed, smaller doses less frequently given have proved most effective when used with the physical measures suggested. One cannot be too careful however, in neural cases in the administration of this treatment, especially where the trouble is accompanied by *recent* paralytic symptoms, convulsions and very high blood pressure. It will be found that considerable judgment is required in the adaptation of this method of the individual patient.

Whenever syphilis involves the nervous system it is a serious matter. As soon as this takes place, its management to a successful termination is not simply a question of antiluetic treat-

ment, such as is usually administered, in the primary and secondary stages of the disease. When we recall that it is said that of all cases during *primary* syphilis, at least 25% involve the central nervous system; and that during the *secondary* period 50% show some involvement of the optic and auditory nerves that may be transitory or permanent; that from 70 to 80% of patients with early syphilitic lesions show spinal fluid changes, and that state hospital records show one out of every six patients admitted as insane, owing their mental disease directly to syphilitic involvement of the central nervous system, it behooves us to pay extremely close attention to the treatment or management of this protein disease. Furthermore, when we stop and reflect that later along a great number of these cases will be mistreated and mishandled as "Neurasthenics" until irreparable damage has been one, there is a further incentive to correct and proper management of this type of case.

Discussion

Dr. Meyer Solomon: Dr. Pope's paper brings up many points for an interesting discussion and food for thought. I think the amount of physiotherapy used should be individualized for the patient for this scientific reason: When you are doing too many things with some patients they get frightened, they feel they have a very serious condition and it produces a fear psychology in them and a bad psychological influence, and it may be difficult to control the patient, and in addition to your organic condition you have an anxiety and neurotic state superimposed upon that. In other patients, on the other hand, especially those who crave attention, doing a certain amount of physiotherapy is very satisfying to them. Looking at this for the moment just from the psychological viewpoint, it encourages them, builds up their hope, builds up faith and confidence in the physician and also in themselves so that in those instances there should be an individualization of each patient to determine how much should or should not be used. I think that should be gauged, looking at it from the psychological viewpoint, only by the reaction of the particular patient, his economic status, his fear state, and so forth.

In all these conditions with the use of any measure, one must consider three factors; first the direct effect of the method you are using, of the therapy you are using upon the tisssues themselves, the physical, the chemical and physiological changes. Then the indirect effect brought about by increasing the general health and by using ordinary sensible physical hygiene to improve the resisting powers of the individual. The third is the psychological influence. No matter what measure we use, those three elements must be considered.

In these cases it seems to me that it is especially necessary to consider these factors. Dr. Pope has stressed one very big point and that is that in handling these cases you have not only the spirochete to handle but you have the body to treat, too; and you have not only the body and disease to handle, but you have a human being to treat also. So that physical hygiene and physical therapy are valuable from all angles. However, I am also anxious to know the specific effect in the way of vaso motor changes and chemical transformations and phsical changes that the physiotherapeutic measures mentioned can have, especially diathermy and the galvanic current I would be interested to know whether they have been helpful and just what the results have been. I would also be very interested to know just what the rationale is and what work has been done, if any, from the experimental side in vitro or in vivo in animals to back up the use of these measures for a direct effect that they may have.

I feel a paper of this sort is helpful in calling attention to the fact that various measures should be used in handling syphilitics, and one shouldn't simply hammer away at anti-syphilitic measures or a specific measure, but think of the case in toto and think of it from all angles

Dr. Curran Pope (Closing): Like Dr. Solomon, I am a Neurologist and Internal Medicine man and I realize fully that the medical man himself can induce a neurosis or a psychoneurosis in his patient. His very personality, his very method of approach, his particular way of handling the case, his manner of talking to the patient, his intonation, his capacity to grasp and hold that individual and destroy fear are essential qualifications that every neurologist who hopes to be successful should at least have to a certain degree. I admit that that is all true but my hospital is devoted largely to ambulant cases in neurology and internal medicine and for that reason we have to a great extent destroyed as far as is humanly possible the idea of hospitalization. My rooms are beautifully decorated; my treatment rooms have been painted and decorated by an artist. Everything in the world that can be done to increase the suggestive side, the contentment side, the home-like side, the friendly side of medicine is brought into that hospital. It is a little place. It

doesn't take care of so very, very many patients; perhaps for that reason it does take care of those who come with a great deal of individual and personal care.

I say that the Doctor is right, that it is not only true in treating these luetic cases of the nervous system but it is true in treating nervous cases and in treating other cases, from an infection up and down the list. The psychology of selling yourself to your patient and selling yourself right and gripping him and holding him and making yourself the rock of Gibraltar for him, is always a great factor in management and in the so-called "disciplining" of patients. Properly handled patients don't need discipline; it is done unconsciously.

An interesting thing that has been observed is that the brains and spinal cords of those people who have been subjected to a lethal dose of electricity, electrocution, have been found like a great many other tissues to be sterile.

The last thing I wish to say is this: I have no course of treatment for anything. The man who has a course of twenty intravenous treatments for syphilis or so many treatments for another thing is, to my mind, not practicing medicine intelligently. Every case that comes to me is put through the most exhaustive clinical examination by myself, and by one of my associates; is then given a complete laboratory examination. The case is then summarized, studied, and the treatment worked out, *not for the disease the patient has, but for that particular patient and for the particular conditions that are present*. Even when you have worked it all out, you are absolutely helpless in predicting what is going to take place. In other words, we have yet no measuring rod by which we can for one minute estimate what is going to be the given reaction to a given treatment of any kind in any patient. So I always start cautiously, feel my way, study the reactions of the patient. I take the trouble to go around to the treatment rooms and examine the patient's heart and pulse and oftentimes look in his eye with the opthalmoscope and do many things to try to inform myself of just what is taking place in that patient. I think the strict individualization of the case and the close study of it, the careful records we keep, all of these tend toward the production of the results that Doctor Solomon has mentioned and are very necessary in any individual case The man who isn't willing to keep careful records not only hurts his patient, but he injures himself.

Sometime when you are thinking of some subject and you think you have a fairly clear grasp of it (I have tried this on myself many a time), sit down and try to write it out distinctly and clearly. You will be dumbfounded to know how often your ideas are vague and borderline So the Doctor is right; let us have our psychological attitude, our correct diagnosis our correct treatment, our correct sequence of treatment, our intensive and personal and individual handling of the patient.

I have been for a long number of years trying to work out something that I thought would be of real value in neural syphilis and I *think* I have at last found something. I say I think I have found something that is going to turn out to be really worth while, although I may later on, have to suffer from that virulent and most deadly digestive disturbance that comes from eating your own words.

ULTRA VIOLET RADIATION AND THE CALCIUM FACTOR IN NORMAL AND PATHOLOGIC STATES*

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In previous papers we have considered the synergistic activity of ultra violet radiation[1] and calcium.[2] The latter element ranks fifth in the quantitative analysis of human protoplasm;[3] and ultra violet radiation has probably always been the most important environmental energy.[4] Calcium fixation is the one universally accepted biochemical activity of ultra violet light, but the exact mechanism by which it is consummated still remains unproven.

Osterman,[5] as early as 1913, maintained that ultra violet light has a tonic effect upon the sympathetic nervous system, and therefore is therapeutically indicated in the vagotonic neuroses, bronchial and enteral spasm, hyperacidity and urticaria. Moreover, he found it of equal value when exhibited with calcium, as adrenalin on the one hand, and belladonna or atropine on the other. Pacini[6] has demonstrated that adrenalin has calcium fixing power in experimental animals, and Goldberg,[7] Simpson and others have emphasised the important role of the thyroid in the development and structure of osseous tissues. These findings indicate that calcium fixation is influenced not only by sympathetic nerve stimulation,[8] but also by the catabolic glands of internal secretion which are developed from the ectoderm. All these agencies may be grouped under one heading as the sympatheticotropic neurochemical mechanism, which accelerates involuntary activities in the kinetic or somatic tissues, and inhibits visceral function.

Ultra violet radiation is absorbed in the uppermost millimeter of the skin. Hence its action may be either directly upon the sympathetic nerve terminals,[9] or in the blood and lymph from the superficial capillaries and lymph spaces of the papillary layer of the derma. Whether the latter route is via parenteral autogenous skin protein broken down as a result of the action of the light upon protoplasm, or whether via unsaponifiable lipoids such as cholesterol,[10] seems to depend upon the intensity of the radiation, and its total quantity per unit of time and per square inches of body surface.

According to Van Scoyoc,[11] the pharmacological action of calcium is as follows:

1. Calcium decreases endothelial permeability.

2. Calcium is specific in its power to stimulate phagocytosis.

3. Calcium is antagonistic to potassium in certain viscera such as the heart and the respiratory and digestive tracts. In the latter system it is also antagonistic to magnesium.

4. Calcium aids in the correlation of the sympathetic and parasympathetic mechanisms.

The above summary suggests a wide variety of indications for calcium medication, but none contradictory to each other if the following experimental and clinical data be accepted.

1. Parenteral proteins irritate endothelial cells, increasing their permeability and producing localized perivascular areas of edema which give rise to the typical allergic phenomena, symptoms of which are termed hay fever, asthma, urticaria and certain forms of eczmoid

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dermatoses. Clinically these are relieved by exhibition of the catabolic endocrines such as adrenalin which stimulates the sympathetic nervous system, or by thyroid, the iodides, calcium and ultra violet radiation, and the relief obtained is very quickly obtained as a rule and satisfactory. If the vegetative system is markedly unstable, subsequent parenteral protein irritants will produce exacerbations unless the patient has been protected by exhibition of calcium preferably along with ultra violet radiation. On the other hand, in some cases similar to those described by Duke,[12] in which there is idiosyncracy to light, local treatment or moderately heavy systemic radiation will call forth a severe compensatory parasympathetic or allergic response, in the form of an asthmatic paroxysm or an urticarial lesion. A similar reaction is not uncommon in hurried injection of calcium intravenously, the pupils first dilating, then constricting along with the complaint of feeling of hyperthermia, followed by more or less profuse diaphoresis. These compensatory reactions are to be expected and the technic should be modified accordingly, in the treatment of all allergic phenomena.

2. Calcium stimulates phagocytosis. Ultra violet radiation acts as a cellular stimulant, varies the osmotic tension of protoplasm, and the electrical action currents present therein. Phagocytosis follows as a natural result of increased metabolism in all cells including the phagocytes, and there seems to be in carefully graded doses of both calcium and quartz light no subsequent negative phase such as is commonly observed after tuberculin and other bacterins. However, if sufficiently heavy doses are given compensatory overactivity and allergic states are to be expected. Although a seeming paradox, subsequent mild dosage with quartz light apparently relieves this by stimulation of the sympatheticotropic mechanism.

3. Calcium is antagonistic to potassium and vice versa. Howells[13] classical experiment in cardiac perfusion demonstrates this. "Stimulation of the vagus is of no avail unless the perfusing fluid contains potassium ions." "A relative increase in potassium causes an action similar to that of the parasympathetic nerves," and of the endocrines which are derived from the endoderm. It is evident from this fact that much information of value should be derived from determination of the K/Ca index as determined by two relatively simple blood chemical examinations.[14] This ratio normally varies from 1.7 to 2.1.[15] In essential hypertony the range is from 2.1 to 2.9. In other words, a compensatory parasympatheticomimetic activity has produced a compensatory increase in blood potassium. It is evident that in this condition both calcium and ultra violet radiation would be contraindicated, and that their antagonistic agencies, such as penetrant heat, diathermy of the liver, or autocondensation, or hepatic extract should be used. McCallum[16] et al, and Major [17] have demonstrated the antipressor action of hepatic extracts both in physiologic states and in hypertension.

Another endodermic endocrine, insulin, is essentially anabolic and acts along with the parasympathetic mechanism. Still another, the anterior lobe of the pituitary body, has anabolic functions in building of osseous tissue, but the effect of both of these upon calcium metabolism is still unsettled. Perhaps the most powerful endocrine so far as calcium is concerned is the parathyroid, which is also of endodermic origin —third and fourth branchial clefts. In parathyroid deficiency,[19] tetany and spasmophilia, the blood calcium is markedly diminished and both parathyroid injections, calcium injections, and ultra violet radiations are all efficient. In all of these the blood calcium is increased, but unequally, and due to different causation. The greatest hypercalcemia is after parathormone injections in which it may rise to a dangerous level—15 or more mg. per C. Greenwald and Ross,[20] and others[21] have shown that this hypercalcemia has occurred at the expense of the calcium reserve in bone and other tissue. Hence

parathyroid would not logically be used as a calcium fixation agent in rickets, tuberculosis, etc., although it might be of value in varicose ulcers, and is of course irreplaceable in parathyroid insufficiency. However, the use of thyroid and parathyroid in the same oral tablet would seem to be a pharmacological incompatibility.

4. The conclusion that calcium with its synergist ultra violet radiation aids in the correlation of the sympathetic and parasympathetic mechanisms, and the corallary that the catabolic endocrines accomplish similar results, may be drawn from the following data:

Nielsen[22] advises ultra violet radiation, calcium, thyroid and other metabolic stimulants in vagotonia.

Pottenger[23] urges the use of calcium in bronchial asthma and tuberculosis, and of calcium and thyroid in the chronic dermatoses of allergic etiology.

Beasley[24] is a pioneer in the use of intravenous calcium in tuberculosis, and recommends with Watson[25] cautious actinotherapy in those pulmonary forms of tuberculosis of the exudative type, which are associated with increased catabolism, toxemia and fever.

Ultra violet radiation is almost specific in the anemias, lymphadenitis, bone lesions and strumous states of childhood, in which calcium fixation is a necessary phenomenon. In old age, this is not so important; in fact in the vascular system is detrimental, hence the usual compensatory vagotonia of advancing age, manifested by bradycardia, decreased metabolism, etc. In the elderly ultra violet radiation and calcium medication are not only often disappointing, but in my own personal opinion should be used with caution. I have seen no harm arise from mild suberythema doses in the aged, up to 82 years.

Ultra violet radiation has other activities besides those associated with the calcium factor, but these are beyond the scope of this paper. Phosphorus metabolism, the phosphorus calcium index of McCollum and the influence of actinotherapy are omitted because of the enormous literature already covering this subject, and because of the fact that in many ways phosphorus and calcium metabolism are synonymous. Blood calcium and ultra violet radiation factors in blood coagulation are important, but yet not thoroughly understood. I have seen the exhibition of calcium increase the bleeding time in a true hemophiliac, the almost fatal hemorrhage from several tooth sockets being stopped only after he had received both a blood transfusion and positive galvanism to the gum.

Like other workers in this field, I have been often disappointed in blood calcium determinations to find a normal figure in a known calcium deficiency case, and I have seen asthmatics grow suddenly worse under vigorous treatment, and have seen the basal metabolism determinations give the very opposite results from what was expected, but if we remember that our chief criterion of judgment after all should be clinical, that variations in both the individual patient and the technic must be accounted for, we will be in a better position to evaluate results. Calcium is absorbed from ordinary food with difficulty, since excessive acidity of the alimentary canal is present in those very cases needing it the most. Hence, I have learned to use intravenous calcium in most cases since the dosage can be regulated more accurately, and absorption is assured. The blood is very greedy for calcium, hence the bones may be deficient and yet the blood calcium high, particularly if vagotonia exists. We should remember that the human body is not just a mass of chemical elements, purely materialistic in action, but a living, compensatory energy transformer[26] adapted to its environment, not the least important factors in which are ultra violet radiation and the minerals, including calcium.

Summary and Conclusions

1. Ultra violet radiation and calcium are synergists, since both stimulate the sympathetic

nervous system and act along with the catabolic endocrines.

2. Ultra violet radiation and calcium are opposed by the parasympathetic mechanism in the normal state of reciprocal vegetative interactivity.

3. Ultra violet radiation and calcium are indicated in all cases of low general metabolism, calcium insufficiency diseases and allergic phenomena.

4. Allergic phenomena are chiefly due to the edema which is the result of increased endothelial permeability caused by parenteral proteins, and are specifically checked by ultra violet radiation, calcium injections, or catabolic endocrines and drugs.

5. Ultra violet, calcium, and the catabolic synergists are contraindicated in advanced pulmonary tuberculosis, toxemias, fever, diabetes and toxic goiter.

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DISCUSSION

DR. MAXIMILLIAN KERN (Chicago, Ill.): Dr. Kime has brought out much regarding the utilization of ultra violet light so far as calcium is concerned. There are a few points which were mentioned regarding the use of calcium in asthmas and hay fever. This subject has attracted more attention than any other in reference to calcium and ultra violet light. The various discussions that appeared in the medical journals all over the world in reference to the exactness of measuring calcium in the blood must have left you in complete confusion, which this paper has so far not succeeded in taking you out of.

There are just as many authorities who came forth with the idea that there is a lower blood calcium in asthmas as there were those who said that there wasn't any. The men who originally worked on the subject in Chicago were Dr. Novak and Dr. Hollender. It was unfair that their subject was so terribly misunderstood. The contention has gone forth that in all cases of asthma they claim a lower blood calcium index, and the contention has also gone forward by conclusion that it is practically the only and sole case of a bronchial spasm in asthma. That was not their intention and I know it was not what Dr. Kime meant to bring out now.

Although it is universally recognized that ultra violet has some dangers in the treatment of pulmonary tuberculosis, I believe, and more so from speaking to Dr. Nagelschmidt privately, it is due largely to the fact that it produces a reaction with all the manifestations of reaction such as high fever. In an acute tuberculosis high fever is naturally present anyway so that to aggravate the condition would be contraindicated; but in a chronic tuberculosis of a joint I believe ultra violet is very highly indicated.

When it comes to the question of toxic goiter I know that ultra violet light is indicated. This is a general toxic condition due to the disturbance of the apparatus of metabolism and in a condition of that sort there might or might not be a disturbance of the calcalcium; but the various effects of ultra violet are known to be absolutely indicated. I don't know how else we can get the sedative effect unless we put them to bed and keep them there shortly, and which I know is contraindicated over a long period.

DR. FRANZ NAGELSCHMIDT (Berlin, Germany): I hope you all will realize the tremendous work and knowledge which has been concentrated in the few words we have been able to hear from Dr. Kime. It is so difficult to handle this matter because really it touches the limits of biology and the experiments that have been done are of the greatest use to clinical medicine. We know in some cases calcium deficiency is present; iron deficiency is present. For many years we used to give, in such cases, calcium and iron. We may give big doses. It is not fixed by the body; we must do something more to fix it.

Patients take their foods, their vegetable foods, and there is plenty of iron present, but it is not fixed. and another individual takes the same food and it is all right. So you must understand that there must be a steering and this steering has been shown in the principles of what Dr. Kime has said.

Now, I may give you some clinical data which illustrates the matter some more. For instance, ultra violet, we know, can raise the level of calcium if it is too low, but that has very little influence on the normal level of blood calcium. This shows you that not the ultra violet alone produces the action, but there must be a reaction between the treatment we give to the patient and between the way the patient responds to the treatment.

As I pointed out yesterday in my paper about endocrines we are very lucky to possess different physical methods, methods which are of use in a different way. We can act on the sympathetic system just as we like.

I may refer to the question of calcium in the treatment for hair loss. If you give a dose of x ray sufficient to produce loss of hair then you see that in the hair roots the potassium disappears and the calcium raises. Then comes the period of the action of the x ray and long before hair begins to grow again, long before this long thing reverses, potassium reappears and calcium disappears. When a normal ratio is reached and we can succeed in our treatment the disturbance stops.

Now we come to the treatment of tuberculosis. I don't think we can spare treatment by ultra violet in our tuberculosis cases in general. I think it does a lot of good, especially in the way of acting on the calcium, but the essayist is quite right in severe cases. It is contraindicated, or at least it depends on the dose. If you have a severe case, high fever and very diffuse tuberculosis and you give one treatment of half a minute to the thorax, you can kill your patient by this treatment. He can get a terrible increase. He can get tuberculosis and the whole disease is mobilized, but if we give a very low treatment to a small area with low intensity and progress slowly so you can apply ultra violet even in severe cases it helps. As you see ultra violet treatment when you read it in the book it

is a very simple treatment, but it is not so simple in practical application.

To conclude, one word about toxic goiter: We can influence toxic goiter by ultra violet, but it takes much too long. We have much more efficint action if we attack the gland. I have treated thousands of cases of mild and severe cases of goiter. I can tell you there is no better method than a very light x ray treatment for light cases with different doses on severe cases to reduce the hypersecretion of the goiter; or we can apply diathermy to the same gland. Of course we cannot afford to apply the treatment to the gland from outside.

I wish that Dr. Kime would go on with his experiments because I am absolutely sure the clinics of medicine will take the greatest advantage of experiments like these.

Dr. O. M. Moore (York, Nebraska): Diabetes has been spoken of as well as other calcium deficiency diseases here. I want to say that the etiology of these things extends back from the particular manifestations of human body energy. It has been shown by experimentations upon animals including human beings that if phosphorus calcium balance is maintained diabetes will not appear. That shows that these balances are necessary. They are all energies that correlate and help each other.

I want to say that the fundamental thing back of all this discussion is this: If you want to trace the etiology of these diseases you will find it in unexpected quarters. You will find it in the stockyards. We are meat-eating people. You find other etiological principles in the Minnesota flour mills. We are manufacturing our flour utterly devoid of the alkaline materials, including calcium, that go into the blood. We consume eighty or ninety pounds of sugar and some scientists say that is the cause of the prevalence of diabetes in the United States. If we have the calcium and phosphorus balanced properly we will not have diabetes. If we quit eating acid producing foods as we do and take our flour as a whole wheat flour and get the mineral alkalis much of the calcium deficiency diseases would disappear from the land.

Dr. J. E. G. Waddington (Detroit, Mich.): The practical point Dr. Kime brought out is diagnosis. We have the sympathetic and parasympathetic nervous system to deal with and the one is antagonistic to the other. Your physical therapy measures are antagonistic one to the other. Ultra violet, unless you know your wave lengths, will be antagonistic. You must not give a dose stimulating the sympathetic nerves when you want to stimulate the parasympathetic.

You will find different authorities tell you different stories. Here is a different story about blood calcium content. One man says certain diseases are deficient in it. Do not be led into giving massive doses of ultra violet unless you are an expert in that line. Barryman, pathologist, gave his dog a tremendous amount of blood chemistry along these lines and he has shown in his little reprint that if you give excessive doses of ultra violet, no matter what the source is, you depress your blood count and get a deleterious effect on it. When we give ultra violet for metabolism we want to give a dose not to cause any erythematous reaction. Keep your dose below that.

Dr. R. T. Layman (Elizabethtown, Ky.): I would like the doctor to discuss a little bit more the action of ultra violet on the thyroid.

Dr. W. A. Lurie (New Orleans, La.): I would like to know if the doctor has any data on the difference of calcium content in the blood of people living in an area that is arid and has a high atmosphere. Does it contain a greater proportion of the inorganic salts, particularly the calcium and lime salts?

Dr. Edwin N. Kime (Indianapolis, Ind.): The treatment of leg ulcer is both systemic and local with ultra violet, systemic because of its effect on the calcium metabolism, and local because of the direct stimulating or irritating effect that we have on the epithelial cells, provided it is used with properly increasing gradations, not over-dosage. Remember not to hit the cells too heavy or you will kill them entirely. Gradually enable them to granulate over.

I have succeeded in covering over with epithelial cells following the resection of a large carbuncle. The surgeons could not successfully skin graft because of the infected, juicy, succulent, soggy condition of the wound. Now, the same principles apply to leg ulcer. Of course, Groves and Vine have brought out the importance of the use of parathyroid extract in this condition, but I think that it acts by mobilizing the blood calcium and carrying it to the ulcer area, but we must remember that in a case of that sort we must use our parathyroid only for temporary benefit. After the ulcer has healed we should stop the parathyroid extract.

Dr. Lurie's question is a practical one. I haven't any data to give on the differential blood picture of high atmosphere and low atmosphere but remembering that the blood is very greedy for calcium, that it tends to maintain its calcium exactly the same as it maintains a certain equilibrium of the hydrogen ions and the alkaline ions of the blood, there is a buffer mechanism which maintains the calcium level within a fairly low limit and I would not expect there would be any great

difference between the two. Remember that the body is a compensatory mechanism and that it is capable of standing a lot of abuse including the many things that we do to it.

Hypertension? This question, and also the question as to the activity of the catabolic agencies, I think was pretty well covered by Dr. Kern. Now, I agree with him absolutely and yet I disagree in some particulars.

The idea as I see it is this: In any experimental work we have to realize that we must be dealing with two factors, either of which is capable of varying. We are capable of varying our ultra violet radiation and we do vary that. We give varying grades of dosage of ultra violet radiation, but on the other hand we must remember the capabilities that are present in the subject matter acted upon, the human body. In other words, the final effect of radiation can be measured roughly, at least, as the algebraic sum of the intensity of the irradiation and the susceptibility of the subject. You know that all along the line any agent acts in the same sort of way, infection, and so forth.

If you are dealing with a patient who has pulmonary tuberculosis with advanced lesions with secondary infections in the chest, pyogenic microorganisms, toxemia and fever it would be folly, I think, probably fatal, to give very heavy doses of ultra violet radiation. Give tiny doses if you give any, in the graded technic of Rollier.

On the other hand, if you are dealing with an individual with very sluggish metabolism, with chronic infiltrated eczemas, those low thyroidal types of cases, then it is very difficult to over-treat them.

After all, remember—and I think this is the lesson I want to bring home as much as possible—that there is always a tendency whenever we develop a certain line of treatment for untrained, unskilled individuals to follow, to make a short cut all along the line. Now, it is possible to train an unskilled, non-medical person in the physics of this. It is possible to take an electrical engineer who could tell you all about the physics and about variations in the intensity of light, and so forth and so on, and explain how we do certain things. He knows how to do it at least, knows how to accomplish certain technical results in a certain sort of a case, but remember that we are doctors of medicine first and foremost, and that with the second factor the variability in the compensatory powers of our patients to react to any agency, whether it be a drug —and there are many valuable drugs; whether it be surgery, and that of course is valuable; or whether it be to physical therapy. In other words, I would like to say this: I am absolutely and utterly opposed to laymen assuming full supervisory powers over the administration of these strong and potent agencies, and I stick to that.

People are self medicating themselves with drugs and that does harm. Now they are trying to put into their homes quartz lamps and treating themselves and that is wrong. Why? Because they see a technician some place establishing a laboratory and operating it himself. I mean by that an unskilled medical technician not being capable himself of determining as the case proceeds whether or not the case is reacting properly or improperly, not having the proper laboratory facilities to check up or the clinical judgment which comes only from long experience. The laymen are trying to do this work and it is up to us to do it right if we are going to do it at all. In other words, as Morse so aptly states, "The man who knows *how* will always have a place, but the man who knows WHY will always be the boss."

TRAUMATIC ARTHRITIS*

E. MARGO, M. D.

OKLAHOMA CITY, OKLA.

In the consideration of traumatic arthritis, two conditions are thought of. In the first place are dislocations and those cases complicated with fractures extending into the joint and, secondly, those cases of injury to parts about the joint without broken bones. To consider the former would necessitate an extensive and exhaustive study of fractures and dislocations in general, for almost every type of a fracture may extend into a joint. Obviously, the reason of this paper is to discuss only the type not complicated by these.

Before dealing with the pathological processes involving a joint, it is well to review its parts. Syndesmology is that branch of human anatomy which treats of the articulations or joints. This constitutes a mode of union between any two separate segments of the skeleton. Its object is either preservation of a rigid continuity of the parts joined together or else the permission of a variable degree of mobility.

A normal joint consists of four structures. The articulating surface is composed of cartilage, synovial membrane, ligaments and synovial fluid. In joints there are neither free bone nor periosteum. Before a diagnosis of a joint condition can be accomplished, a study of these parts must be made. The cartilage is very important; it is injury or disease to this structure which leads to chronic arthritis or the recurrence of chronic joint conditions from slight trauma. This has to be kept in mind in obtaining the past hstory of industrial injuries about the joints when the severity of the signs and symptoms is not warranted by a mild injury.

The synovial membrane is to be considered especially with blood effusion in the joint cavity. Also in those cases with deep lacerations and extensive bruising of the soft parts adjoining.

The synovial fluid is a great indicator of inside joint damage, manifesting itself in variations of pressure, color and consistency.

Probably the most important part of a joint relative to trauma is the ligaments. These are intra-capsular and extra-capsular. They help to hold the joints in place with strong bands on the sides re-enforcing the capsule investment supplying defective and weak areas of the joint capsule.

Another set of structures to be considered are the muscles, blood vessels, nerves and other soft tissues adjacent to the articulations.

Following an injury about a joint, the first change that takes place is swelling of either the soft parts outside the joint or the synovial membrane. In most cases, the flesh and skin outline will indicate this by the enlargement present. When this inflammatory change of the synovial membrane is present, fluid will form.

After these acute changes subside, such as pain, swelling and visible vascular effects on the skin, which factors may be termed distinctive, then the stage of production appears. If infection sets in from some remote focus through the blood stream, an infectious arthritis results. However, without bacterial invasion, the injured joint passes into the second stage of atrophy to muscles and bone. These changes mentioned do not occur immediately, but extend over a period of time. It is at this time that visible signs of waste and limitation of motion are present. This partial ankylosis can be said to be due to atrophy of muscles from disuse and weakness, tearing of soft parts and their replacement by fibrous tissue, torn ligaments or cap-

*Read at X Ray and Physical Therapy Meeting, Kansas City, Mo., August 29, 1927.

sule, and those follow up changes in the joint resulting from foreign matter entering the cavity, such as blood. When such a hemorrhage occurs, then the case should be considered as an acute arthritis. This is especially very common in injury to the knee. This condition, when not properly treated early, will ultimately show bone pathology of the articular surfaces.

Extravasation of blood in the soft parts from ruptured blood vessels close to a joint should always be remembered. Occasionally this cannot be made out early from inability to thoroughly examine the site of injury due to pain and spasticity of the muscles and limitation of motion resulting therefrom.

The x ray is of value in these injuries to eliminate chronic arthritis with bone changes, fractures and dislocations.

There are four essential points in the management of traumatic arthritis.

1. Complete rest.

2. Encouragement of absorption of extravasated blood and other residues of congestion.

3. Passive motion.

4. Voluntary exercise and gymnastics.

With rest, there is a tendency toward relaxation of the injured parts. Muscle spasm from both trauma and pain is materially aided, and in some instances is completely relieved by immobilization. Absorption of increased amount of fluid in a joint is also hastened by cessation of motion.

This is one place in therapy where physical remedies stand out in efficiency. To actually get the greatest benefit in these cases, direct application of heat is imperative. In mild cases, conductive and conversive heat will suffice when followed by other remedies. However, no direct treatment will prove as valuable as conversive heat. It is only right and proper that diathermy should be employed since it hastens absorption of exudates, relieves congestion and pressure, thereby relieving pain, increasing nutrition, hastening healing and relaxing the spasm with which the joint is frequently surrounded. Treatment should last at least 30 minutes, preferably longer, and given to the tolerance of the patient with comfort and not a specific prescribed amount of milliamperes.

Under the influence of diathermy, the patient will tolerate a greater amount of forcible manipulation when such treatment is indicated.

The method of application varies with the joint to be treated. I am a firm believer in treating not only the joint but surrounding parts as well because it facilitates other measures such as massage and exercise. For this reason, the lateral method applied to the joint does not serve well but in a few instances.

Elimination of the side to side method is not a hobby of my own. It is simply necessary from an anatomical and physiological standpoint. For instance, you cannot apply diathermy to an ankle by placing the electrodes laterally as efficiently and comfortably as by placing one electrode on the planter surface of the forefoot, and the other on the leg, posteriorly. The opposite is the case on the shoulder. Here, the best method is with the clamp sponge electrode. Special methods of application are indicated in other joints, therefore, a technic should be devised for each individual and each part.

The application of diathermy should be followed by scientific massage. I find this used very little. Personally, I do not believe these cases receive a complete treatment without it. Massage means a manipulation or handling of the soft tissues by movable pressure in the form of stroking, rubbing, pinching, kneading or beating, performed with a therapeutic aim. Do not confuse it with medical gymnastics, which is treatment by means of exercise of the organs of the motor apparatus. In traumatic arthritis, both methods have many points in common, but

they should be understood as separate methods of therapy. You can massage a hematoma of soft tissues, but it is not possible to apply gymnastics, since the soft tissues are not organs and certainly not organs of movement.

A delicate touch is a thing to be desired and cultivated. The average technician or graduate nurse has no conception of scientific massage. An expert massuese is employed in our institution.

In addition, we employ manipulation, gymnastics and the sinusoidal current. Also occupational therapy when possible to be obtained is of prime importance.

Mechanical support is often required locally to rest the injured part and aid in recovery. The support should produce ease and comfort to the patient and at the same time not restrain the rest of the body. This may be produced by bandaging, adhesive, splints or casts.

Hydrotherapy may also be used with advantage in some cases where a combined result of heat and mechanics is applied. This is well performed by the whirl-pool bath.

Other modalities may be used in the therapy of these conditions, but to no better degree in value.

Besides all these physical therapy methods, we should not forget drugs. The main prerequisite in all the modalities to be employed should be a thorough and complete diagnosis. No effort should be made of their use without a known object in results to be obtained. The kind and method of physiological purpose desired will definitely imply a certain method in the course of treatment, for every modality has its limits in reactions relative to normal or pathological tissue, thereby requiring a close observation in physical and chemical equations.

CASE REPORTS

No. 1. D. K., male, white, age 19, student.

Diagnosis: Traumatic arthritis of right knee.

History: Injured knee playing foot ball.

Examination: Knee swollen and painful.

Treatment: Aspiration of bloody fluid. Strapped. High frequency and massage. Ten treatments given.

Result: First treatment gave relief from pain. Result good on dismissal.

Disability: Three weeks.

No. 2. T. P. V., white, male, age 23, oil field worker.

Diagnosis: Traumatic arthritis of right shoulder. Partial ankylosis.

History: Injured January 3, 1927; pain became severe at point of shoulder one week after injury.

Examination: June 21st, tenderness over right shoulder. Limitation of motion. X ray negative except osteoporosis of joint bones.

Treatment: High frequency and massage. Graduated exercises. Fourteen treatments given.

Results: Good. Excellent condition after fourteen treatments.

Disability: Two weeks.

No. 3. V. R., white male, age 20, laborer.

Diagnosis: Sprain of right wrist.

History: Lifting heavy wire, arm became painful. Doesn't khow definite time of injury. Wrist became swollen. Treated at home with hot water and turpentine applications.

Examination: Three weeks after injury. Wrist swollen. Some tenderness. X ray negative.

Treatment: Radiant heat and massage. Plaster splint applied. Eight treatments given.

Results: Good. Only slight soreness on extreme motions at dismissal.

Disability: 11 days.

No. 4. E. G., male, white, age 32, physician.

Diagnosis: Traumatic arthritis right knee.

History: Injured knee playing volley ball.

Examination: Knee tender, swollen and inflammed. Increased amount of fluid. X ray, no pathology.

Treatment: High frequency and massage. Elastic support to knee. Four treatments given.

Results: Good. Recovered.

Disability: None.

No. 5. J. T. B., white, male, age 21, laborer.

Diagnosis: Traumatic injury to right foot.

History: Steel angles fell on right foot. Came immediately to hospital.

Examination: Right foot badly swollen and tender. X ray negative for fracture.

Treatment: High frequency, massage and bandage support. Two treatments given.

Result: Patient resumed work after second treatment. Recovered.

Disability: Two days.

No. 6. I. R., white, girl, age 16, student.

Diagnosis: Traumatic arthritis left knee with possible injury to internal semilunar.

History: Injured knee while taking exercise, knee "caught," four weeks later knee "caught" again.

Examination: Soreness on either side of patella. Inability to flex knee beyond a right angle or fully extend without pain. Probability of injury to internal semilunar. X ray negative.

Treatment: High frequency and massage. Cast to knee for one week followed with strapping. Ten treatments given.

Results: Discharged, result good.

Disability: Two and one-half weeks.

No. 7. Mrs. C. P., doctor's wife, white, age 28.

Diagnosis: Arthritis of both ankles from traumatic injury.

History: Both ankles were injured when struck by a car while crossing the street.

Examination: Discoloration of both ankles and left calf. Greatly swollen and tender. Right ankle is more swollen under fibula. X ray negative.

Treatment: Plaster cast applied to left ankle from midway of calf to toes second day after injury. Later cast was cut in half to allow removal and replacement for treatments. Adhesive strapping to left ankle. Nine treatments of high frequency and massage given.

Result: Good, discharged walking fine without aid three weeks after injury.

CONCLUSION

In conclusion, I wish to report the results of 50 cases of traumatic arthritis treated recently in our institution. These cases were not picked or chosen from a large number; they were obtained from our index file as the last 50 cases treated and dismissed. Of these cases 19 were improved and in 31, good results were obtained. In other words, in 38 per cent they were improved in function when dismissed and their occupations resumed. In time this percentage would be reduced practically in half. Restoration of function from muscle waste due to disuse very promptly responds with exercise. While in 62 per cent, the results were very good. By this is meant such complete restoration of function that their occupations were resumed with no disability. The time loss of disability entailed in these cases is not given because the injuries were not of a certain region only, but were of general nature including injuries to the shoulder, elbow, wrist, knee and ankle. However, it is *very well evident* the decrease of time in disability of industrial cases by treatment with the aid of physical therapy in a general way.

MULTIPLE FURUNCULOSIS IN INFANCY WITH SPECIAL REFERENCE TO ULTRA VIOLET RAY THERAPY*

M. L. BLATT, M. D.

CHICAGO, ILLINOIS

Furunculosis as a disease of infancy is fortunately rare. Its incidence is largely in those neglected infants of the lower strata of society, in the waifs of the overcrowded orphan asylum and in the sadly emaciated victims of chronic intestinal indigestion or of a chronic disease. So well organized are our infant welfare stations that poverty is no longer a reason for improper feeding. More than one generation is necessary, however, to combat the ignorance of mothers and obtain absolute co-operation in infant feeding.

Many of our public infant asylums are so overcrowded that individual attention to feeding is limited. The result is dyspepsia and concomitant lowered resistance to organisms that are ordinarily mildly infectious or saphrophytic. Tuberculosis in the early months of life is a violent disease, but toward the end of the first year it frequently assumes a more chronic form Grafted upon this, furunculosis is often a terminal infection. It is a disease of the white babies and occasionally of the Mexicans, almost never of the negro. In the infants with low resistance there is frequently no rise in temperature, but in those in whom the disease occurs while the child is in fairly good health, very high temperature may result.

The highest temperature I have ever seen in an infant who recovered was in one with this disease. The temperature reached 108 and over two hundred furuncles were opened during its course. The lesions in this case were present over the entire trunk and had apparently followed a camphorated oil application, an irritant very frequently the cause of a folliculitis in children. In general the disease does not select the trunk, but has as its site of election the scalp and nape of the neck. Because summer months are the hardest in infant feeding, we see most of our cases during the summer and autumn. It is the terminal blow to a system long insulted by undernourishment. Only by the most drastic and painstaking efforts may such infants be saved.

There is, of course, a less severe incidence —the occurrence of from one to a dozen furuncles in well nourished babes or children. These are frequently located elsewhere than the scalp, and occur as abscesses in the subcutaneous fat of the perineal region and thighs—occasionally on the arms. They are always accompanied by severe intestinal derangement, a marked rise in temperature and some prostration; but they show no such tendency to continuously reappear in crops as do the much smaller lesions of the furunculosis of the debilitated. They furthermore react promptly to surgical drainage and are rarely in need of further treatment.

The clinical picture of the severe furunculosis of the atrophic infant is that of a daily crop of new lesions, deeply situated, easily palpable, pea size at first, and if untreated, breaking down into skin covered abscesses containing as much as a cubic centimeter or two of yellow or white staphylococcus pus. It is uncommon to see a solitary lesion as a primary form. Crops of from five to twenty seem to appear daily. If opened early a tiny drop of pus can be expressed.

Many forms of treatment have been attempted in the past. Wet dressings macerate the skin without avail. Ointments of ammoniated mercury or icthyol have been tried. Our best results are obtained by a combination of

*Read at fifth annual meeting, American College of Physical Therapy, Chicago, Oct. 22, 1926.

surgical intervention and ultra violet ray. Every lesion must be incised and the pus expressed daily. Cotton soaked in 1/10000 bichloride should be used to absorb the tiny droplet of pus. The scalp is then rayed, first on one side and then on the other, for from three to five minutes, at a fifteen-inch distance. The child is then given a general ultra violet treatment of short duration, with the lamp at about twenty inches. The involved area is then painted with mercurochrome. The process is repeated daily. Each day a smaller number of new lesions appear. The old indurated previously opened furuncles are quickly absorbed.

In addition to local treatment the diet is carefully regulated. Codliver oil and orange juice are always added, if not already in use. Our results have been very much better since we have added to our surgical and general treatment ultra violet ray.

We agree with A. E. Schiller (Grace Hospital, Bulletin 1922) that the ultra violet ray stimulates the normal defensive power of the individual. There is a large amount of bacteriological evidence showing the sterilizing value of the ray. Hyperemia of infected areas is nature's first attempt at protection as evidenced in the histology of inflammations. Its production by stasis was advocated by Bier and has proven useful in many acute surgical conditions. An active hyperemia, mild in degree, results from the use of the ultra violet ray, and is undoubtedly a factor in the elimination of infection and the production of local immunity.

Doerr and Muldovan have shown that ultra violet light reduces the antigenic activity of proteins. This seems quite in accord with Pacini's theory that the photo-sensitive bacteria have a reduced activity when exposed to ultra violet ray, while the less sensitive skin of the host has an elevation of resistance.

At least one other factor seems to be of importance in the production of localized immunity in furunculosis—namely that of phagocytic action of leucocytes. Made up as the furuncles are of these defenders and scavengers, alive and dead, their presence may be increased and their efficiency advanced by the positive chemotrophic action of freed calcium ions. That calcium ions are effective in this manner has been demonstrated experimentally in Dr. H. G. Wells' laboratory by Miss Wolf, who found them to be the only inorganic ion chemotactic.

Phosphates have this same property, except when combined with negative potassium ions. That ultra violet ray influences both calcium and phosphorus metabolism has been demonstrated, and it is therefore quite possible that the activation of these ions by the light are effective in this disease through their secondary influence upon the phacocytes.

SUMMARY

Furunculosis is frequently a severe complication and often a terminal infection in young infants.

It necessitates serious time consuming treatment.

The ultra violet ray used both locally and generally in these cases is a valuable adjuvant to surgical drainage and distinctly lessens the number of crops and number of new lesions.

CONCLUSION

The ultra violet ray has a very distinct place in the treatment of furunculosis of infancy.

30 N. Michigan Ave.

DISCUSSION

DR. FRANCIS SENEAR (Chicago, Ill.): I have not had occasion to use ultra violet therapy in the treatment of this condition because, as the essayist has already pointed out, it is extremely rare. Pediatricians see it much more commonly than do the dermatologists. In the cases that I have seen, the course of the disease has been exceedingly severe, and in not a few instances,

has ended fatally. The usual methods of therapy employed in furunculosis are successful in some cases, but the course is prolonged. I think the dermatologists as a whole are less favorably disposed toward ultra violet therapy perhaps than they should be. I think this is due in part to the fact that many of us have employed this means of therapy with a somewhat biased mind; we thought it impossible to secure the results that were promised in the advertising particularly, and in some reports in the literature. Yet I think as we go on with a rational viewpoint and employ the therapeutic measures afforded by the various types of ultra violet therapy that we increase our results in the treatment of dermatological conditions very materially.

I can only say that I am exceedingly interested to hear the report of a clinician with the experience of Dr. Blatt, in which he has secured such splendid results with the use of ultra violet therapy as an aid to the older. more established, but not particularly effective, methods of treating this condition.

Dr, Nagelschmidt: For twenty years I have had many opportunities to treat the disease in question in children as well as in older persons. I agree fully with the ideas we have just heard, and I think that the application of ultra violet treatment to this disease means that great progress has been made. Furunculosis is a symptom that is easy to understand, but it is not a simple symptom of a skin disease. It is a symptom of the trouble of the whole metabolism. I think that the reaction of the skin showing furuncles, for instance, depends to a very great degree on the endocrine balance of the organs. Ultra violet has a marked influence on the calcium, phosphate and potassium content of the skin, but I think this circumstance is only of a secondary action; it is not the primary value of a treatment or of a disease to have an influence on this chemical composition, but the chemical composition just as well as a disease, for instance from a more distant cause, should be considered.

We know that ultra violet rays have a positive leukotactic action; they attract leukocytes. We know that some other forms of lights, for instance a red light in the form of your own lamp, or the yellow rays present in a carbon arc lamp have the opposite action, have an action of putting away the leukocytes, have an anti-leukotactic action. So, I think if we treat children we must look at the state of furunculosis in which they are. If furunculosis is growing up and has a tendency to be transformed into pus, then we may by examination of the serum see that the opsonic index of the blood is a negative phase. If they heal up and there is filtration present, then we see the opsonic index in the positive phase. If we make our ultra violet treatment in the negative phase, then the furuncles will increase, the circulation will become quicker and stronger, and if we come in the positive phase, then we will have the opposite result.

Generally in children you find furuncles of any kind, in any stage of development, and so it is clear that this one medicament, one application of one kind will hardly give the good results in all stages present, because the danger to come in the negative phase is rather great and would increase the degree of the disease. I think we should combine treatments. In acute stages I prefer for the first time the carbon arc lamp or if the suppuration is present everywhere, I take the neon lamp; then if a state of improvement is reached, I take the ultra violet, using it not only for the furuncles, but with the idea of improving the whole metabolism of the child to produce vitamines in the way of a biological action of the ultra violet rays.

Dr. E. P. Zeisler (Chicago, Ill.): I was very much interested in Dr. Blatt's paper, and I certainly agree with his general expressions of opinion. My experience with these cases has been relatively limited. I have seen many more cases in adults than in infants. I have found both in the infant as well as those in adults the ultra violet light seems to be a distinct addition to the treatment. I believe it is valuable as part of the general sterilization plan of treatment, which was first called to our attention by Bowen, of Boston. This includes the thorough and free change of underwear, the use of various disinfectants on the skin, frequent baths, the use of antiseptic soaps plus restriction of carbohydrate intake. I am a little doubtful or hesitant about using even weak bichloride of mercury applications in infants as I have seen a number of cases of severe dermatitis produced by the use of bichloride of mercury. I think ordinary boric acid applications are quite sufficient.

There is another method of treatment that hasn't been brought out, which is of definite value in these cases; namely, a form of non-specific therapy which many of you I am sure are familiar with. I refer to the use of sterilized milk intramuscularly, which is perfectly safe in infants. The dose is one-half to one c. c. intramuscularly, with the idea of increasing the leukocytes and increasing the infant's resistance. With the general radiations of the body, as mentioned by Dr. Blatt, this method will result in a more rapid resolution. As Dr. Blatt said, these cases are far more common in dispensary practice and in institutions like the Cook County Hospital than in our offices.

Dr. Seybold: I would like to add one more therapeutic agent that can be used in the treatment of furunculosis. If you will examine the blood in these

cases, you will very frequently find that there is an increased blood sugar. That is one reason why you find furunculosis in diabetes, for instance. In the treatment of furunculosis, therefore, if you will cut the sugars down in the diet, and I have found that by using insulin, three drops occasionally, you will benefit most of your cases in addition to your other treatment.

Dr. Blatt (Closing): It was a pleasure to hear the discussions of these gentlemen on the subject that all of us I am sure who see these cases are so vitally interested in. However, when the cases come to us they are not quite the picture that the last speaker put to you. Our cases are in many instances almost morbid infants. While it is possible that their blood sugar may be high, our best results in many of these atrophic children have come through the use of glucose in our salt solution intravenously, and we have often tided them over the shock of this severe disease from which they are suffering.

In regard to the endocrine relationship to furunculosis, I am not in a position to say very much. That the glands of internal secretion suffer in the atrophy that we so frequently see as a precursor of furunculosis, there can be no doubt whatsoever. When an atrophy is so severe that the subcutaneous tissue, the subcutaneous fat is almost lost, that muscle tone has disappeared and the infant is in a condition of shock, one can have no doubt that the same condition exists in endocrine glands. However, we have to wait until we can boost the endocrines before we reach the period of immunity. Our best results have been, as I have said, accomplished by combining surgery, which we have always used, with ultra violet as an additional factor.

If I left you with the impression that we put wet dressings of bichloride on these cases, as I inferred from Dr. Zeisler's speech, I left you with an impression that is erroneous. We do not do that. These are treated dry and open. The scalp is simply wiped off with a weak bichloride solution and no application of any kind is left except the application of mercurochrome to the lesion itself and the surrounding area.

OXIDATION*

PROFESSOR ALBERT J. MATHEWS
University of Cincinnatti

CINCINNATTI

The subject of oxidation, upon which I have been invited to speak, is a very large and important one and might be considered from many different aspects. The time at my disposal is so short that I shall confine myself to certain phases of the problem which have most interested me and leave to Dr. Clark, whose work has been of such fundamental importance, the task of describing the methods of measuring the intensity of oxidizing and reducing power and the remarkably interesting results obtained by the use of his methods.

I wish to speak more particularly of the general role of oxygen in the body; the part it plays in the production of vital phenomena from the bacteria to human beings; and the possible mechanism of its action. My paper will be then largely a theoretical paper and will be concerned in reality with the nature of vitality. I hope the statement of the problem will interest you as it has me, even though nothing of an immediately practical nature will come out of it.

There are, as every one recognizes, two great and fundamental problems connected with matter. There are two great questions which must be answered in some fashion or other by any theory which pretends to account for matter. These two problems are gravitation, the great mystery of the inorganic world, and vitality, the great mystery of the organic. No theory of the nature of matter is worthy of any attention which cannot give some sort of an account of these two mysteries. I have no time to consider the first of these puzzles; but the second, vitality, is intimately bound up with the problem of oxidation. It may indeed almost be said to be the problem of oxidation, since in a certain sense oxygen is literally the breath of life.

Oxygen plays, in my opinion, a double role in the production of vital phenomena, for there are two aspects to vitality. There is being and acting. Our lives may be considered to be essentially a product of these two things. These are so interrelated as almost to be a single thing. It is almost inconceivable for us to be, without at the same time having the power of acting. Being and action are indissolubly associated in every living thing. I am and I act. If being be identified with time and action with energy, since energy is that which acts and time is that which endures or is, our vitality may be called "energy-time." And if it really is this, it should be possible to measure it, as regards its quantity, in units of energy or ergs, and in units of time or seconds. We should be able to express the quantity of vitality in any one of us in terms of so many ergs-seconds. But of course we are not yet able to measure vitality, so that we cannot do this.

To pursue an offshoot of our main theme for a moment, it is interesting to notice that sunlight or radiant energy is also expressed in terms of ergs-seconds. The constant of radiant energy known as Planck's constant, is 6.547×10^{-27} ergs-seconds. So that some day, if this reasoning is correct, we shall be able to express the amount of vitality in any one of us in terms of a certain number of pulses of light, in terms of so much sunlight. And, on the other hand, we shall be able to express the quantity of vitality in light in terms of units of vitality. Another interesting result of this identification of vitality with action and being, or energy-time, is that it shows vitality to be four dimensional;

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for energy has the three dimensions of ordinary space, and time may be regarded as, and indeed is, a fourth dimension, so that vitality, like matter or space-time, is itself four dimensional. In other words vitality is a universal attribute of all matter and of all space-time, that is of the ether, since space-time is another name, the geometrical name, of the fundamental continuum of which either is the mechanical name.

There is no doubt in my mind that light is the source of all the vitality on the earth's surface; so that the reasoning just given, which started from the very simple statement that vitality had the double character of being and action, and which may seem rather metaphysical, has led us to a concrete conclusion which shows the relation of sunlight to life and which makes self evident almost the recently discovered fact of the importance of sunlight for health. This fact of the role of sunlight is not a recent discovery to ordinary uneducated simple folk, but it is a recent discovery to scientific men. Like that other great and epoch-making discovery that milk is a good food for babies, it had been taken for granted by simple souls, who did not suspect that it was not known to scientists.

Now oxygen plays a role, I believe, both in being and in action. And it is that of which I wish to speak. First as regards being. Is oxygen related to the production of this ego, this "I" which dwells in my body? And how is this "I" produced? What is it,

There are two things, it seems to me, which are essential to the production of the unity of every organism and every cell of the body. There are two things, in other words, necessary for the appearance of that "ego" or "entelechy" which dwells in every cell and in every organism. These two things are a certain structure *and respiration*, or oxygen.

We have only to examine ourselves to discover that these two things are necessary. If we stop breathing, our "ego," this "I," disappears. Or, if anything destroy the structure of the nervous system, and of part of it especially, it disappears also, even though breathing continues. The unity of the body, which is "I," depends upon the nervous system. The nervous system is the fundamental structure which is necessary. And it also depends upon the respiration of the nervous system. Even though the respiration of the rest of the body continue, if we inhibit the respiration of the nervous system by anesthetics or acidity or in other ways, the unity or ego departs, and this in spite of the fact that the gross structure of the nervous system is unchanged.

That the unity is produced in us by the nervous system has been well indicated by Sherrington by his expression "the integrative action of the nervous system." It is this system which integrates, or makes one, of the different parts of the body. It creates its unity, and that unity is the ego. Now if in us this unity is due to the nervous system, and if every organism shows, as it does, the same sort of unity which we show, it is probable that every cell and every organism must have some kind of a nervous structure in it which integrates it. That this is the case in all multicellular animals from the sponges to man is an established fact; that all plants have something of the same kind of a system has recently been urged by Professor Bose; and in the unicellular plants and animals Professor Kofoid with his pupils has recently shown that many if not all infusoria, unicellular animals, have a very distinct nervous system in them remarkably like that in higher animals. We may therefore conclude that every organism, every living unity in other words, has in it a peculiar matter of the nature of that in the nervous system of ourselves, and it is this which produces the unity of the organism; and probably of every cell of our bodies, since each cell has a unity also, has such a system of its own in it. A nervous system then is one of the factors which is necessary that organisms may behave as units; in other words, may behave in

such a manner as to provide for the welfare of the cell or organism as a whole. And this is the fundamental and characteristic behavior common to all forms of life from the lowest to the highest.

There is another fact about this unity which we must notice. In us at least it is a *mental* unity. This "I" thus produced is a psychical entity. We are conscious just so long as this unity persists, and when it is lost our consciousness as an individual is lost also. The individual is conscious and is a unit. Now since this is the case in us, and since all living things from the simplest unicellular plants and animals to man show the same kind of behavior, a behavior which indicates the exercise of choice, will, volition, appetite, desire, and so on, it is only fair to suppose that all forms of life have a form of psychism or mentality not different in kind from our own, and which continues in every cell as long as the cell continues to be a unit, but which vanishes from every cell and organism just as soon as it ceases to be a unit. Consciousness as an individual depends upon unity of the individual. It is its individuality. The cells of our bodies act as sensible and intelligent beings, picking out of the blood just those things they need, making products to protect them against poisons and so on—they *act* as intelligent beings because they *are* intelligent beings. They must have something of the nature of consciousness in them since they have unity. It is this which is called by Driesch their entelechy and by Bergson the "elan vital." This vital unity, or being in other words, which in us is mental, may be assumed to be mental in all living things as well, since they act as we do. Vital unity is a mental unity in other words, but it depends upon a physical structure, the nervous system. It has also not only the power of being, that is consciousness, but also of acting, that is will.

Now in us we know that if oxygen is taken away from the nervous system or if the oxygen is prevented in any way from uniting with the nervous system, our mentality, our unity, departs. And that is the case also with all forms of life, although it takes in some a longer or shorter time for the effect to be produced than in others.

How now does oxygen play its part in the production of mental unity or consciousness? I conceive that our mental unity is produced in much the same way that the unity of the magnet is produced. In the magnet this unity is produced by the orientation of the electron orbits; in the case of an electet it is produced by the electrical orientation of the molecules of the substance; and I conceive our unity, or consciousness as an individual, rather than as a group of molecules, is produced by the orientation of the molecules of which the nervous system is constituted by means of their mental axes. Mentality, in other words, is conceived to be a fundamental property of all matter, just as magnetism and electricity are, but it is only when the matter is organized in a certain way that a large mental unit is produced, so that the property hitherto concealed becomes visible to us. I suggest that this orientation of the molecules is such that the mental axes of the molecules of the nervous system (in reality the time axes) are arranged in a palisade arrangement, the axes parallel to each other. And for this orientation to occur it is necessary, for some unknown reason, that a molecule of oxygen be joined to the brain or nervous molecules. Just as soon as the oxygen is withdrawn the molecular orientation is lost. And just as soon as the molecular orientation is lost the mental unity or individual consciousness is lost, since then the axes are directed in all directions although the outward structure of the nervous system remains apparently unaltered. And oxygen is acting in this same way in producing the unity of every cell. Oxygen then in this way may be conceived to play a part in the production of that unity of the organism which is its *being*.

But the second role of oxygen is also highly and equally important. Action, or will, is as characteristic of life as is being. Action means energy. Energy by definition is that which acts. Now the oxygen which has made possible the mental orientation of the molecules of the nervous system of all cells, and thus produced mental unity and thereby consciousness as an individual, has also provided a source of energy by which the mental may act physically. And this phase of the action of oxygen is no less important and interesting than the other. The oxygen of the air contains a very large amount of energy. This is made visible as heat and light when it combines with wood or other substances. This energy has been put into the oxygen by the green plants. They got the energy from sunlight and they passed it on into the oxygen atoms of carbon dioxide. This they split apart or it fell apart. The carbon they retained and combined with water to make carbon compounds, the carbohydrates; but the oxygen with the imprisoned sunlight they turned loose into the air. The energy of the sunlight is in the oxygen in the form of potential and kinetic energy, of the kinetic energy of the electrons which constitute the atom, and in the form of the potential energy of the orbits of the electrons. The atom in this energy-rich form is larger in volume than when it was in the form of carbon dioxide. The period or time is also increased.

This oxygen, then, which unites with and thus constitutes a part of the living matter of the nervous system of all cells has plenty of energy in it. To make use of it, machinery is necessary. The exact nature of that machinery is what we are trying to find out. I have not time to go into this. But, to make a long story short, it seems probable that, when a sugar group is attached to the living oxygenized molecule, either directly or more usually indirectly through another molecule, for example such as insulin and phosphoric acid, the energy in the oxygen attached to the living molecule can flow over the bridge thus created by insulin and phosphoric acid from the oxygen into the sugar. The sugar molecule thus enriched in energy is rendered in its turn highly unstable, and breaks down and unites with other molecules and thus sets up that metabolism by which the cell is reconstituted and growth occurs. The flow of energy is regulated by the conscious act of the cell. The interesting thing for this society of electrotherapeutics is that this transfer of energy from oxygen to the sugar or other food stuff is accomplished by an electrical current, the so-called current of action of all cells. A negative electron passes from the sugar molecule outward across the boundary of the cell or across its nervous matter, which is located at the surface or near it, and into the oxygen atom, which is thus reduced. In other words, a current of energy passes inward represented by a current of positive electricity; and the point at which this is happening appears hence to be negative when electrodes are applied to it and to any other point not thus acting.

This gives then a clear picture, in harmony I believe with all the facts, of the origin of those electrical currents which spread from every acting organ, including the heart, throughout the body, which characterize every form of vital activity in every form of life of every kind, whether plant or animal; and these currents closed through surrounding tissues and organs undoubtedly play a profound but still badly known part in the regulation of animal forms and in normal physiology.

Oxygen, then, not only contributes to our consciousness or being, but, having itself a store of energy in it and constituting a part of the sentient conscious structure of all living matter, it gives to that consciousness the power of acting physically by its mental will.

You will readily see that this conception will give a theoretical basis for electrotherapeutics; for by means of electrical currents applied to cells or tissue, oxidations and reductions, the

discharge or storage of energy, loss or gain of consciousness, must be produced at many different points and the process here sketched reversed or stimulated. This whole conception depends upon the electrical conception of oxidation;—a conception which Dr. Clark in this country has particularly studied and which I hope he will farther develop here,—and has thrown great light on the possible mechanism of the production of the electrical phenomena characteristic of every form of living matter. And it has in addition permitted this very hasty and superficial sketch of the nature of vitality and an insight into the possible mechanism by which vitality, *a universal property of created and uncreated alike*, is made visible to us in living things.

DISCUSSION

Professor William Mansfield Clark (Washington, D. C.): I heard a most practical exposition on the applications of electrical energy and realized that the little researches we have done cannot give any light on the principles of it in your operations. Then I heard a philosophical essay, a very delightful one, and wonder what the points are that I can get out of it for practical application. I am totally unqualified to discuss Professor Mathew's paper. In the first place a good deal was philosophical and I am no philosopher.

He spoke, for instance, of a concept involving quantity and certain other units, but as Professor Mathews himself knows, the quantom is a unit introduced for convenience. No one knows what it is and so with a good many of the other concepts he introduced into his philosophical contribution. We have come to realize that a great many of these things are definitions of convenience. That is not always thoroughly realized and because it is not realized I want to call your attention to an aspect of the whole matter with which I know Professor Mathews himself will agree and with which I know you will all agree. It is one of the most self evident things. When we come to philosophize about a great many of the things of life it is perfectly permissable, so long as we remain philosophers, but when we are incautious in our speculations we sometimes open the way to those who are outside of the pale of reliable medicine to pick up our words and apply them without knowing their limitations and means, and so cause a great deal of suffering by their misapplication. I think we should guard against letting ourselves lay open to that sort of thing because we all know the avidity with which the quack picks up this sort of thing and causes untold human suffering.

I have been asked to touch upon the work we have been doing. I won't take your time because I am afraid it has not been carried to the point where it is applicable, and what you people want is applicable concepts. I wish to say flatly that the concepts that we have employed are concepts of convenience. We never have planned. We have demonstrated certain principles. We have been studying to be concerned intimately with electronic bulbs We have been applying the rigid methods of dynamics; determining free energy transferred by the certain oxygenc systems, and we have played in good luck by being able to apply electrical methods. When we have the quantative data we find some very good hints that we are concerned with pairs of electrons between certain organic bodies. In the reduction of methylene blue by the living cell or any chemical agent we have a hint that two electrons shared in their energetics go into the methylene blue and, according to the conditions of the solutions, the hydrogen iron tacks on where it can. What we have really been doing, what our data shows, is the free energy of transfer. We are able to determine quantatively the free transferring. We have been able to determine quantatively the free energy of ionization. We are able now to describe the conditions under which methylene blue can be induced, the conditions under which the indigo, sulphates and a great many other dyes can be reduced. We now are able to show quantatatively, numerically, the direction in which oxidation or a reductive reaction will go.

We are glad to have done this work as a contribution to physiology because these dyes, methylene blue, the indigos, have been used very extensively in general biochemistry without it being known the conditions under which the reduction or the oxidation takes place. We have given a numerical magnitude to those tendencies. When we come to study some of the processes of more particular importance to physiology, such as reduction of cystene to cystein or the degredation of sugars, etc., the method seems to be absolutely worthless. I do not say that by following it through to the bitter end we may not find the method of applying. but to be perfectly honest, while we hang on to the hope that it will be useful, to date it has been proved not useful.

There has been an aspect of the whole subject which the work with the dyes casts some light on. Professor Mathews contends that ozygen is essential to life. I think we puncture that conception. In the first place it has been known for years that oxygen

is not necessary to all life. There are a great many anarobic bacteria which can live for considerable periods of time in the absence of oxygen. You say, well how do we know Some years ago when bacteriology came to the fore, Pasteur rediscovered what Spoligoney had shown many years before, that bacteria live in the absence of oxygen. Spoligoney lived before the days oxygen was discovered and he called it air. Gunning claims that the methods of the bacteriologist have been intangible. The minute you removed the least trace of oxygen, bacteria ceased to function. He at last came on the floor of the French Academy with vials of meat, etc., which he claimed had been preserved by very great oxygenic absorption. Pasteur arose to say he was convinced because he and his assistant, Chamberlain, had observed that bacteria function in a media so far reduced in oxygen that they retain the reductin of indigo. What did Pasteur know about the equilibrium of oxygen and indigo? Nothing. Today we know the equlibrium conditions under which indigo can exist in the absence of oxygen or in the presence of oxygen, and if the bacteriologist can prove that the indigo has entered into a state of equilibrium with the oxygen present, the oxygen present is about that which would be the one indiscreet molecule of oxygen in a space the size of the earth. That, of course, is an extrapolation. It is comparable with saying we know the vapor pressure of platinum in a room temperature. We have no hesitation in saying that if indigo is entered into equilibrium with oxygen present, the oxygen present is virtually nil.

I will close by emphasizing this one point, that throughout a series of years we have been trying to get hold of and measure accurately the free energy for definite fixed systems so that in time we can build up a bounty of data by which there can be told when and how far and in what direction certain reductive processes take place. Until that time comes we do not wish to speculate beyond the realm we can go with the data we have in hand.

Dr. Charles F. Stokes: I have not the temerity to ask any of you to join in the first iridescent dream nor in the second struggle of science with practicality, but perhaps it would add to the comfort of Professor Mathews and Professor Clark to know that it has been recently reported from London that the controversy between the wave theory and the quantity has been settled. They have agreed to operate Monday, Tuesday and Wednesday under the wave theory, Thursday, Friday and Saturday under the quantity theory, and Sunday they knock off for a rest.

Dr. A. Bern Hirsch: In expressing our admiration and appreciation of Professor Mathew'h paper, it gives the opportunity to congratulate the Association from the fact that we who deal with the more material methods of relieving the sick and injured, feel that we have a right to be proud of having induced the professor to come to us so that he can show the medical world that, in addition to the practical or material methods of treatment we do like to have the theoretical opportunities shown us so we can see what the future holds for us to better our methods of treatment. I think the professor has given us one step forward in that direction.

Professor Albert P. Mathews (Closing): I am used to hearing the criticism that such ideas as those I have expressed are a kind of a wild dream. But I feel sure that they are not a useless speculation. I regard the greatest shortcoming in American science that it does not speculate more. At the present time on all sides we are getting new developments in science, but America has not contributed one single fundamental conception to science, not since Gibbs at any rate. The American scientists are doing nothing but measuring constants. I may be considered a dreamer and metaphysician by many American scientific men, but I will not be so considered, I believe, by foreign scientific men. I have talked this subject over with some of the very ables physicists of the world and they do not regard it as a wild dream, not by any manner of means. We do not have to go to the philosophers for the idea that matter may be formed from light.

Clifford, one of the most eminent of British physicists, dead many years now, suggested that light changes into matter. That idea is one of the coming conceptions of science. The most eminent physicists in England are of opinion that it happens because light is matter, having all the qualities of matter, except permanence in space. It has weight, mass, energy, electric charge, magnetic flux. It has gravitation; it is attracted by the gravitational field of the sun; and the question is, how does this temporary, rapidly speeding matter become fixed in space and transformed into this permanent form we call matter? The greatest physicists in the world are working on this problem. I have made a definite suggestion that a certain wave length of light will do this. If I could have tested it I would have done so. I went to the General Electric Company to see if it were possible to produce wave lengths short enough. They must be about 10^{-14} ems, to produce a hydrogen atom; but it is not possible to make them shorter than 10^{-11} cms. There is, however, another possible physical test of the theory which can probably soon be made, and which will show whether this is a wild dream or whether it is fact. I have, myself, little doubt of the outcome of the experiment when it can be tried.

As regards anaerobic life being possible without oxygen, as Dr. Clark suggests, that is a matter known to everybody. I do not mean to say that oxygen is the only form of energy available for living beings, but that it is the principal one for the great mass of living things is self evident.

We cannot as yet hitch together the physical and the mental, but I do not consider it a wild dream that it will be done. Someone has to do it and I believe it will give us an explanation of a great many things we do not know and will show how intimately related the physical and mental are.

I am glad that Dr. Clark warned you against accepting the views I presented. He was afraid you might not realize how speculative they were. Meanwhile he himself keeps right on doing the most valuable work on oxidation. I am sorry he did not have time to present his valuable and interesting results to you. He is doing the tangible and concrete things, and I have the greatest admiration for his work. As a scientific man, also, he was afraid that you would not realize that the nature of the quantum was unknown to scientific men. But I think I know what it is. I have made a new theory of light, which is soon to be published, which reconciles the corpuscular and wave theory. Light is corpuscular, but it is not made of corpuscles which are shot like bullets through the ether. The corpuscles generate new ones by radiation, undergoing a slight twist as they radiate into the ether beyond them. This twist is the transverse vibration. This is a continuous radiation theory . These corpuscles each contain an amount of ergs-seconds equal to the quantum constant divided by 2π. I have called them "helelectrons," since these light corpuscles are essentially partially formed, temporary and reversible electrons. Light is then a form of matter. And if matter has vitality, so must also light.

GALVANIC TECHNIC*

J. U. GIESY, M. D.

SALT LAKE CITY, UTAH

First let us get the question of polarity clearly pictured in our minds. If you do not have such knowledge firmly grounded, you cannot intelligently employ the galvanic current, because for an intelligent use of galvanism we depend entirely upon such knowledge for our predictaed effects.

So then: The negative pole is alkaline in its reactions from a chemical standpoint. It is a vaso-dilator, expands blood vessels, increases the nutrition through an increased flow of blood to the part. It is a tissue softener, both through its effect on the circulation and through its peculiar affinity for the water molecule—its electrolytic action—whicn attracts moisture to the part. It is tissue destructive in the higher potential, and consequently will actually break down tissue when properly employed. It ionizes elements of the halogen group and acids.

The Positive pole is acid in character, a vaso-constrictor, narrowing the blood supply of a part. It electrolizes water away from the point of application, consequently hardens and tones up tissues. It ionizes metals and alkalies.

And now, with these points fixed in mind we are ready to take up some points of technic. Someone has asked for the galvanic treatment of hemorrhoids. There are two methods of attack, and they are opposites. I will describe the one I have most commonly used during the past nineteen years first. Expose the pile. In the male patient one must do this through a speculum, preferably pronged so as to allow the tumor masses to drop in between the blades. In the female it is easier to expose the pile as a rule, through the ready means of everting them by means of a finger in the vagina. But in any case first get the tumor to be attacked in sight. Then, either steady the pile with a tissue forcep or the fingers, take a fine guage hypodermic needle and inject a two to five per

A round table discussion held during the Convention of the American College of Physical Therapy, Oct., 1926.

cent solution of procaine or novocaine close to the tumor base. Three or five drops if properly placed at the base will do the work. Then take a needle—an ordinary needle will do—though I prefer zinc. Have this hooked up to a cord from the machine by a small galvanic needle holder and insert the needle into the tumor mass, getting the tip as near as possible to the center of the tumor. Don't go through it. Keep the needle tip inside the mass. Use the negative current as the active pole and employ about a ten milliampere current. Watch it work. As the current runs you will find little bubbles of hydrogen gas coming out around the shaft of the needle, and you will find the tissues first about the needle and then in a widening zone begin to darken. When this occurs it is time to get out, and give the pile a few days in which to gradually retract. Or—

You can reverse the process, using the positive pole as the active pole, and running your current until the pile, instead of darkening, begins to blanch because its blood supply has been cut off through the vaso-constricting, blood coagulating, acid, tissue hardening effects of this pole. Here you really create a thrombotic condition of the pile and the absorption, while slower than with the negative, will be less painful because there is less tissue destruction and consequently less healing reaction. These are the two galvanic technics of treating this condition. You can gain the same end with a surgical diathermy, which today is quicker, easier, and the one which I myself employ. But as the question as affecting galvanism was asked, I have answered it by giving you the method which I have formerly employed. And now I want to speak of still another galvanic means of treatment in cases which you will sometimes meet. There may come to your office a patient with a bleeding, ulcerated mass protruding from the anus, and complaining of acute distress because of that fact. In such a case take a bare copper electrode—a prostatic electrode will do nicely provided it has a fairly long copper tip. Insert this into the canal in the middle of the protruding mass, and turn on your positive. You will be surprised after three or four treatments of an approximate duration of fifteen to twenty minutes with a ten to fifteen milliampere current, to see how the condition has retracted and improved. I have had patients who, after a few such treatments, enjoyed almost complete comfort for months.

DISCUSSION

DR. DESAULNIERS: Would you use a carbon ball in such a case rather than a copper tip?

DR. GIESY: I never have. I see no reason why you could not. It is the effect of the positive pole which does the work.

QUESTION: How would you treat a so-called tic, an involvement of the trifacial nerve? What current would you use? I don't mean so-called herpes zoster, but a trifacial neuralgia. Ordinarily we use the negative pole on these so-called herpes zosters. What is the difference?

DR. GIESY: I have used about everything. The first cases I ever treated were by galvanism. I employed a positive pole over the distribution of that particular branch of the trifacial which was apparently involved, with the negative as closely positioned above the ganglion as possible (of course we can't reach the ganglion). Some of the cases showed marked improvement with this technic, but frankly I admit I have not been as successful with these cases as I would have liked to record. Today, therefore, I use a combination of galvanism and diathermy and radiant heat. Many of them will not improve by any treatment until the focal cause of the trouble is discovered. You must not forget that many of them are directly the cause of some such focal pathology. You must not forget that you are physicians. There is no reason why you should treat the condition alone and forget to discover the cause, simply because you are trying to use electricity, rather than drugs or a surgical procedure. I have a case today which while not a tic, will stress the point. Seven years ago, this patient fell down and struck her chin on a concrete step. She had a great deal of pain in the cervical region, which has continued ever since. The x ray showed a marked arthritis of the upper five cervical vertebrae. Under diathermy improvement has been great enough to warrant the hope that she will be entirely relieved.

But—at the same time I had a woman referred to my service, showing the same type of arthritis in the

neck. She, however, had badly infected and deeply buried tonsils. Their removal was advised. This, however, the patient consistently refused. Diathermy was used in this case identically as in the other, but without improvement since the focus of trouble was not cleared. This was a result which I predicated from the start, and regrettably my prediction was verified. When last heard from this patient was going to the West Coast to see if a change of climate would not do the work.

Tonsils? No, I do not treat tonsils with galvanism. I employ diathermy if I do not use the knife. You can do a fulguration or a coagulation and be sure of your result.

Somebody wants to know about goitre. They are treating it now with Diathermy. Under any conditions you are not going to treat more than one or two types electrically—I mean with diathermy or galvanism. You may treat your simple hyperplasias, your goitres of adolescence, your post puerperal goitres, and perhaps in some instances your simple adenomas by electric attack. If you are going to do it galvanically, you will do it in one of two ways. You have and must employ a double choice. If the condition is one of long standing, in which there has been a lot of fibrous degeneration, use your negative pole directly over the goitre. You need circulatory stimulation here. Metabolism broadly means normal function as well as completion of bodily function. Circulation means metabolism in this sense. Whatever unbalances circulation will result in disfunction either above or below the normal line of the organ involved. In an old fibrous condition you wish to return circulation as nearly as possible to normal. Therefore use the negative over the goitre, with a positive disbursing pad.

If on the other hand, you have an earlier and more acute condition, use the positive pole over the thyroid with a negative indifferent pad. This is galvanically speaking. These are its two methods of choice, depending on the condition of the individual case. Diathermy is based on the same idea—the tissue softening, circulatory stimulating effect produced in the diathermic area. With a current strength of seven hundred milliamperes for seven or ten minutes to induce hyperaemia, followed by an iodine spray to the thyroid region, a very rapid iodine absorption will be induced and a great many cases will clear up. Once in a while, however, you will get a case, even of long standing, in which iodine medication will not be tolerated. In such cases it should be omitted as a matter of course.

If you are using galvanism and wish to produce the iodine effect, all one needs to do is to place the iodine in solution or in the form of a Potassium Iodide Solution on the negative pad, and allow ionization to carry it into the circulation through the skin capillaries. You can get sufficient ionization in this way to give definite systemic effects.

Voice: In view of the fact that you have too much iodine, I don't see why it should be used.

Dr. Giesy: I was not speaking of toxic goitre or colloid goitre, or cystic adenoma, or any such type. You would not treat such cases electrically. But in the cases of the type I have been discussing I get about 80 per cent results and have for years.

Somebody asks concerning gonorrhoea. I do not even try galvanism in this disease. Diathermy is the modality which I employ and it will give good adjuvant results. In male cases I use a prostatic electrode with from 700 to 900 milliamperes through a large abdominal dispersing pad. After diathermy for fifteen to twenty minutes change to a moist abdominal pad and leaving the prostatic electrode in place use a sine wave for massage. In this way you focus, as it were, the diathermic heat on the prostate and seminal vesicles. The intense heat stimulates circulation and relaxes the gland. It brings about a hyperaemia, and hyperaemia means increased blood, which means an excess of serum. And as you know an excess of serum means a sweeping in of nature's own defensive forces.

Question: Do you treat chronic ovarian conditions the same way?

Dr. Giesy: By diathermy, in many instances, yes.

Question: Is it necessary to use a thermal electrode?

Dr. Giesy: If by thermal electrode you mean one equipped with a thermometer, you can or not, as you like. The best thermometer you can get is the patient's own sense of tolerance. No two patients will stand the same degree of current. Learn each individual's point of tolerance and follow that guide. Remember they will build up tolerance, but that you must be careful because you can get burns without the patient knowing that tissue is being destroyed until afterwards. So one must be careful. The instant a patient begins to complain of discomfort you have reached a danger point. The average patient will tolerate from 600 to 900 milliamperes at a first seance without complaint. They will work up to a tolerance of from 1000 to 1200 rapidly. These figures are not hard and fast. One should explain to the patient the possibility of burning if they attempt to take too much and advise them to speak instantly upon any feeling of discomfort.

There is a safety point in all this which I wish to bring out. Long before any actual tissue destruction is occurring you will get a sensation of ache. Your patient will complain of a rectal ache, a vaginal ache, a muscle ache, but you will get no burning at that point if you reduce the current slightly, and by such reduction of current strength, the ache will be instantly relieved.

QUESTION: How do you treat Uterine Carcinoma?

DR. GIESY: Not with Galvanism or Diathermy. I leave them to the radiologist or the surgeon.

QUESTION: What treatment do you employ in uterine displacements?

DR. GIESY: Let us take a case of retroversion as an example. And let us remember that the majority of uterine displacements are due to a loss of uterine muscle tone. If the uterus is adherent in its abnormal position, you will have a hard time getting it up by any save surgical means. But if there are not adhesions, if the uterus is movable, use your positive pole intra-uterine. Let the current of from fifteen to forty milliamperes run for from twenty to thirty minutes, unless the patient complains, and—always start with a weak current and work up to the patient's tolerance.

You will find nearly all such uteri enlarged. Once in a while, however, you will find a small, hard fibrosed uterus. That is not the sort we are discussing, however. Such a case will come to you for an ammenorrhoea rather than for displacement. But these large, flabby, boggy uteri, practically have an endometritis 100 per cent. And if you are convinced that there is an endometritis use a negative pole in the uterus for a few treatments and after that go to work with the positive. Under such a technic you will find the uterus begin to shrink. It will begin to tone up and gain muscular strength. In order to hasten the latter effect one may, after the straight galvanic seance, switch to a slow sine, using the same uterine electrode and simply switching to the sine current. From day to day and week to week you will then find the uterus correcting its own displacement. In seeking to gain this result I like to use a large indifferent pad over the pubes. If I am trying to treat a fibroid I use the same placement of electrode and pad. Or one may use a dispersing pad on both abdomen and under the lumbar region with a double connector, connecting both pads to the negative pole. And if you want to do still more you can cut out a tin electrode long enough to surround the patient's body, wrap a moistened towel about her, place this tin strip over the towel, and bandage the whole into place with an elastic bandage so as to make an effective belt electrode. With such a technic you can gain very satisfactory results with fibroid conditions, stopping all bleeding and all symptoms. I have done it for years.

QUESTION: How would you treat a lacerated cervix?

DR. GIESY: I do not electrically. That is a surgical condition. If, however, you have a cervix with a number of infected follicles and erosion about the os, that is a different case.

Here you would have local infection, almost certainly endocervicitis and probably or at least possibly an endometritis. In such a case the proper technic would be to use your galvanic current upon the endometritis and the endocervicitis, one or both, and then take a small zinc tip electrode and puncture the infected follicles. In the latter instance use the positive pole to the needle tip electrode, destroy the infected follicle by positive, electrolysis and zinc ionization and let them heal up. You can use diathermy for the same result. We must realize that electricity is but one division or section in the spectrum of universal force. Each and every modality shades into the next. There is no hard and fast dividing line. And so—one may blend his modalities and his results very much as an artist blends his colors. One must know his currents rather than his "onions" in order to gain such effects. And—if you are using currents of a milliamperage, such as we have recently seen recommended by certain men in present day literature, you must indeed know your currents in order to employ them at such a strength. If you are using a galvanic current, about twenty milliamperes, for instance, you are going to get sticking of your copper sounds in the cervix or any orificial canal not sufficiently patulous to prevent close contact, almost as a matter of course. You may loosen the sound in two ways, however. If it is not very adherent and you are working in a cervix from which you wish to remove a lot of coagulated membrane, you can simply pull it out. If it is so tightly gripped, however, that you fear too great a trauma, reverse the poles of your current, let the negative run for a minute or two and it will slip out.

QUESTION: In treating hemorrhoids, do you treat more than one at once?

DR. GIESY: Not if they are large. If small you may do so. But if large it is better to confine the attack to one tumor rather than set up a reaction which will put your patient to bed and make him both physically and mentally sore. And here is an interesting point you should not lose sight of: Frequently if you destroy one of a major group of hemorrhoids, the effect on the vascularity is so great that you find you do not need to attack the others. They simply fade out,

QUESTION: You say you prefer diathermy today in treating hemorrhoids. How do you treat them with that?

DR. GIESY: The main idea in using diathermy in this condition is really to convert a fluid hemorrhoid into a thrombotic one, I think. With a small needle electrode inserted into the tumor mass one may easily do that. The needle being in place, one grounds the current and gets a flash inside the tumor mass itself. Its interior lights up instantly like the filament of an incandescent lamp. When that happens one may look for success. One does not need to coagulate the entire mass. Once the blood supply is coagulated the pile will shrink and recede. The thrombotic interior gradually absorbs with no surface sloughing, because a thrombus in an interior pile, owing to the looser tissues and the nature of the circulation, is a far different matter from an external thrombosed hemorrhoid. In the latter condition it is better to slit the tumor and express the clot. After all we are doctors and merely because we have electrical machines in our offices is no reason why we should employ them to pull teeth.

DR. DESAULINERS: Do you use the bi-polar method in hemorrhoids with diathermy?

DR. GIESY: Yes. If you are using galvanism your indication of progress is the pile itself. First it will blanch and then begin to darken. When it begins to darken you have done enough.

MR. PATTERSON: How would you avoid an electrical fissure?

DR. GIESY: I've never had to. I have had some considerable sloughing of the tumor mass at times, but no fissures as end results.

QUESTION: What about rectal papillae?

DR. GIESY: Simply expose them and coagulate them with a galvanic needle tip electrode.

QUESTION: How do you treat anal fissure?

DR. GIESY: I know of no better electrical method than to use a copper or zinc (I prefer zinc) electrode used to follow down the course of the fissure, using a positive current of a strength sufficient to bring about surface coagulation. Following such treament under local anasthesia, the majority of them will heal in from one to two weeks.

QUESTION: How do you treat Rectal Fistula?

DR. GIESY: A rectal fistula is nothing but an infected sinus. You can treat it galvanically by using a fine wire positive electrode and coagulating its channel, but you do not want to treat the entire channel at once. Therefore it is better to use shellac on your wire, except that part which you wish to be active in the deeper channel, say for a length of about three-quarters of an inch. The reason for this is that if you treat the entire canal at once, the more superficial portion may close first and leave the more deeply infected portion still active with a resultant recurrence inevitable of course. And in this work always use the positive. The negative coagulum is soft, boggy, moist. The positive is dry, hard and tough. It is the latter you want in this condition. And if your fistula goes above the sphincters, don't try to treat it electrically at all. Use surgery. Remember we are doctors, not faddists. I trust you may have gained some information from this discussion, and if there are no more questions, owing to the lateness of the hour, we will close. It is now a quarter past six, and I thank you for your interest.

EDITORIAL

ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

A Journal of Ideas and Ideals.

A. R. HOLLENDER, M. D., Editor
Suite 820—30 North Michigan Avenue,
Chicago, Illinois

Original contributions, exchanges and books for review should be forwarded to the Editorial Office. All business matters including advertising should be handled through the office of the managing editor, 1216 Medical Arts Bldg., Omaha, Nebraska.

ALBERT F. TYLER, M. D., Managing Editor

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Sixth annual meeting American College of Physical Therapy and Clinical Congress on Physical Therapy—Hotel Sherman, Chicago, October 31 to November 5, 1927.

PROGRAM

CLINICAL CONGRESS OF PHYSICAL THERAPY

and

SIXTH ANNUAL MEETING

AMERICAN COLLEGE OF PHYSICAL THERAPY

Oct. 31 to Nov. 5, 1927

HOTEL SHERMAN—CHICAGO

SPECIAL RAILROAD RATES

Special railroad rates of one and one-half fares on the certificate plan have been granted for the Clinical Congress and American College of Physical Therapy by the following passenger associations:

Trans-Continental Passenger Association
Western Passenger Association
Central Passenger Association
Southwestern Passenger Association
Southeastern Passenger Association
New England Passenger Association
Trunk Line Association

A reduction of one and one-half for the round-trip on the "Certificate Plan" will apply for members (also dependent members of their families) attending the meeting of The American College of Physical Therapy to be held at the Hotel Sherman, Chicago. The arrangement will apply from the following territory:

	Going Dates of Sale
Colorado (Julesburg only)	Missouri
Illinois	Nebraska
Iowa	No. Michigan
Kansas	No. Dakota
Manitoba (See Note)	So. Dakota...Oct. 27-Nov. 2
Minnesota	Wisconsin
Colorado (except Julesburg)	New Mexico
Montana	Wyoming....Oct. 26-Nov. 1
Utah	Oct. 25-31
Arizona	Nevada
British Columbia	Oregon
California	Washington
Idaho	Oct. 24-29

Note: Manitoba—on Great Northern, Northern Pacific and M. S. T. P. & S. S. M Rys., also from Winnipeg via Canadian National and Canadian Pacific.

The following directions are submitted:

1. Tickets at the normal one-way tariff fare for the going journey may be bought on dates listed above (but not on any other date).

2. Be sure when purchasing your going ticket to ask the ticket agent for a certificate. Do not make the mistake of asking for a receipt. If, however, it is impossible to get a certificate from the local ticket agent, a receipt will be satisfactory and should be secured when ticket is purchased. See that the ticket reads to the point where the convention is to be held and no other. See that your certificate is stamped with the same date as your ticket. Sign your name to the certificate or receipt in ink. Show this to the ticket agent.

3. Call at the railroad station for ticket and certificate at least 30 minutes before departure of train.

4. Certificates are not kept at all stations. Ask your home station whether you can procure certificates and through tickets to the place of meeting. If not, buy a local ticket to nearest point where a certificate and through ticket to place of meeting can be bought.

5. Immediately upon your arrival at the meeting, present your certificate to the endorsing officer, as the reduced fare for the return journey will not apply unless you are properly identified as provided for by the certificate.

6. *No refund of fare will be made on account of failure to either obtain a proper certificate, or on account of failure to have the certificate validated.*

7. It must be understood that the reduction for the return journey is *not* guaranteed, but is contingent on an attendance of not less than 250 members of the organization and dependent members of their families at the meeting holding regularly issued certificates from ticket agents at starting point showing payment of normal one-way tariff of not less than 67 cents on the going trip.

8. A Joint Agent of the carriers will be in attendance on the days of the meeting to validate certificate. If you arrive at the meeting and leave for home prior to the arrival of the Joint Agent, or if you arrive at the meeting after the Joint Agent has gone, you cannot have your certificate validated, nor secure the benefit of the return reduction.

9. If necessary minimum of 250 regularly issued certificates are presented to the Joint Agent, and your certificate is validated, you will be entitled to a return ticket via the *same route* as the going journey at one-half of the normal one-way tariff fare from place of meeting to point at which your certificate was issued up to and including November 9th, 1927.

10. Return tickets issued at the reduced fare will not be good on any limited train on which such reduced fare transportation is not honored.

ANNUAL COLLEGE BANQUET

The Annual College Banquet is the main social event of the Clinical Congress and annual meeting. The fellows of the college are urged to be present. Guests of the meeting and their ladies are cordially invited. Some interesting talks will be made by prominent men in the profession. The toastmaster for this occasion will be the incoming President, Dr. J. C. Elsom, University of Wisconsin, Madison.

Preliminary Banquet Program

Introductory Remarks and Welcome
DR. A. R. HOLLENDER,
Chairman, Convention Committee.

Physical Therapeutics in the Medical School Curriculum
DR. J. C. ELSOM,
Toastmaster and President

Progress of the American College of Physical Therapy During My Incumbency
DR. DISRAELI KOBAK,
President, 1926-27

Early Pioneers in Physical Therapy
WILLIAM BENHAM SNOW, New York City

Attitude of the County Medical Society Towards the Promotion of Scientific Physical Therapy
DR. J. H. HUTTON, Secretary
Chicago Medical Society

Informal Talks by Many Others to Be Selected by the Toastmaster

MUSIC—ENTERTAINMENT

Banquet tickets will be obtainable at Degistration Desk

HOTEL ACCOMMODATIONS

The new Hotel Sherman, which has been selected as headquarters for the 1927 meeting of the American College of Physical Therapy, is located at Clark, Randolph, Lake and LaSalle streets, in the heart of the loop with most of the principal theatres and stores within a radius of two and one-half blocks. This hotel, which has been designed for the handling of conventions, will provide an exhibit hall which will directly connect with the meeting room.

The fact that the new Hotel Sherman has six restaurants is of special interest to the delegates, inasmuch as a wide range of prices and service is provided within the hotel building from the famous College Inn to the sandwich shops. It is possible to get club breakfasts at 45c, luncheons for 50c or 60c, and dinner for 90c and

$1.25 in some of the restaurants. The College Inn is famous for its $1.00 luncheon. This restaurant has been been patronized at noon by Chicago business men and convention delegates for a great many years.

These restaurants include (aside from the College Inn) the Celtic Grill, Clark Street Coffee Shop, Old Town Luncheon Room, Lake Street Sandwich Shop and Clark Street Sandwich Shop.

The new Hotel Sherman makes a special effort to take care of each individual reservation at the rate requested, and the special rate for the American College of Physical Therapy begins at $3.00 for single rooms and $5.00 for double rooms. The rates range as follows: Single rooms, $3.00, $3.50, $4.00, $4.50, $5.00, $5.50 and $6.00, and for rooms with double beds, $5.00 and $6.00; rooms with twin beds, $7.00, $8.00 and $10.00. Two single connecting rooms are priced at $6.00 to $10.00. New Hotel Sherman has 1,700 rooms each with bath, and 75 per cent of these rooms are priced at the hotel's minimum rate of from $3.00 to $5.00.

We respectfully advise you to send in your reservation early, since the hotel can give you better service when they know well in advance what the Association requirements will be, or by writing to the Chicago Office of the College, Suite 820, 30 N. Michigan Ave., Chicago.

DIRECTORY OF ROOMS FOR GROUP AND SECTIONAL MEETINGS AND SCIENTIFIC AND COMMERCIAL EXHIBITS

INSTRUCTION CLASSES

Monday, October 31st
Group (1) Crystal Room
Group (2) Gray Room
Group (3) West Room
Group (4) Club Room

Tuesday, November 1st
Group (1) Crystal Room
Group (2) Louis XVI Room
Group (3) West Room
Group (4) Club Room

Wednesday, November 2nd
Group (1) Crystal Room
Group (2) Gray Room
Group (3) West Room
Group (4) Club Room

JOINT SESSION AND FORMAL OPENING OF CLINICAL CONGRESS ASSEMBLY
Grand Ball Room

SECTIONAL MEETINGS

Thursday, November 3rd
Section on Medicine—Pediatrics—Diagnosis—Endocrinology
Grand Ball Room
Section on Surgery—Gynecology—Urology—Orthopedics
Louis XVI Room
Section on Eye, Ear, Nose and Throat
Club Room

Friday, November 4th
JOINT MEETING OF ALL SECTIONS
Grand Ball Room

The Commercial and Scientific Exhibits will be held in the Exhibit Hall on the mezzanine floor.

The Registration Desk will be located at the entrance of the exhibit hall.

SCHEDULE—SCHOOL OF INSTRUCTION

Classes, Monday, October 31st, 1927

	Group 1	Group 2	Group 3	Group 4
9 to 10	Galvanism—Giesey	Sinusoidal Currents—Coulter	X Rays—Fouts Radium—Hanford	Medical Diathermy—Titus
10 to 11	Medical Diathermy—Walke	Galvanism—Waddington	Sinusoidal Currents—Coulter	Ultra Violet Therapy—Howell
12 to 2	LUNCHEON Inspection of Scientific and Commercial Exhibits			
2 to 3	Static Currents—Titus		Medical Diathermy—Chapman	Galvanism—Morse
3 to 4	Ultra Violet Therapy—Kime	X Rays—Tyler Radium—Schmitz	Static Currents—Titus	
4 to 5	X Rays—Fouts Radium—Tyler Hydroth'y—Pope	Ultra Violet Therapy—Kime Therapeutic Exercise—Ewerhardt	Ultra Violet Therapy—Schiller Hydrotherapy—C. E. Stewart	Sinusoidal Currents—Morse Therapeutic Exercise—Elsom
5 to 6	Therapeutic Exercise—Elsom	Hydrotherapy—C. E. Stewart	Therapeutic Exercise—Ewerhardt	Hydrotherapy—Pope

6 to DINNER
7:30 Inspection of Scientific and Commercial Exhibits
7:30 to 9 Extension of the Surgery of Neoplastic Diseases by Electrothermic Methods
George W. Wyeth, M. D., New York City

Classes, Tuesday, November 1st, 1927

9 to 10	Biophysics of Ultra Violet Light—Bachem		Demonstration of Diathermy Technic—H. E. Stewart	Autocondensation Methods C. E. Stewart
10 to 11	Industrial Physical Therapy—Walke	Demonstration Diathermy Technic Chapman	Biophysics of Ultra Violet Light—Bachem	
11 to 12	Demonstration of Diathermy Technic Waddington	Industrial Physical Therapy—Walke	Surgical Diathermy—Giesey	Surgical Diathermy—Willmoth

LUNCHEON

Inspection of Scientific and Commercial Exhibits

2 to 3	Autocondensation Methods—Grover	Autocondensation Methods—C. E. Stewart	Industrial Physical Therapy—Duval	Demonstration of Diathermy Technic—Chapman
3 to 4	Oral Diseases Lurie		Autocondensation Methods—C. E. Stewart	Industrial Physical Therapy—Duval
4 to 5	Surgical Diathermy—Kolischer	Surgical Diathermy Kobak	Oral Diseases Lurie	

Classes, Wednesday, November 2nd, 1927

9 to 10	Massage—Pope	Demonstration Clinic Light Therapy—Howell	Demonstration Clinic Galvanic and Sinusoidal Currents—Elsom	Demonstration Clinic Galvanic and Sinusoidal Currents—Morse
10 to 11	Urology—Jones	Massage—Ewerhardt	Eye, Ear, Nose and Throat Denman	Eye, Ear, Nose and Throat Wahrer
11 to 12	Dermatology—Lester Hollander	Urology—Hirsch	Massage—Pope	Demonstration Clinic Light Therapy—Howell

LUNCHEON

Inspection of Scientific and Commercial Exhibits

2 to 3	Demon'tion Clinic Light Therapy—Schiller	Dermatology—Norris	Urology—O'Connor	Massage—Ewerhardt
3 to 4	Demon'tion Clinic Galv. & Sinusoidal Cur'ts—Waddington	Demonstration Clinic Galvanic and Sinusoidal Currents—Giesey	Dermatology—Greene	Urology—Nelson
4 to 5	Eye, Ear, Nose and Throat—Cottle	Eye, Ear, Nose and Throat—Novak	Demonstration Clinic Light Therapy—Fouts	Dermatology—Greene
5 to 6	Gynecology—Chapman	Gynecology—Willmoth	Gynecology—Schmitz	Gynecology Giesey

COMMERCIAL EXHIBITS

Acme International X Ray
Atlas Electrical Devices Co.
American Journal of Physical Therapy
Archives of Physical Therapy, X Ray, Radium
Bleadon-Dun Company
Burdick Cabinet Company
Battle Creek Food Company
Belgard Spero Optical Co.
Cameron Surgical Company
Electric Solar Company
Ellis Mfg. Company
The Fair
H. G. Fischer & Company
General X Ray Company
Harold Surgical Instrument Company
Hanovia Chemical & Manufacturing Company
High Tension Company
Paul E. Johnson, Inc.
McIntosh Electrical Corporation
Victor X Ray Corporation
Vitaglass Corporation
Wappler Electric Company

These exhibits will be housed in the large exhibit hall of the Hotel Sherman. No doubt many new things will be shown. Several of the manufacturers have taken large spaces in order to accommodate the large attendance of physicians anticipated at this year's gathering.

OPENING OF THE CLINICAL CONGRESS AND SIXTH ANNUAL MEETING

Wednesday, November 2nd, 7:30 P. M.

Welcome—

A. R. HOLLENDER, M. D.
Chairman, Convention Committee

1. Address—Progress in Physical Therapy During the Past Year

DISRAELI KOBAK, M. D., Chicago
President of the College

The evident function of critical co-operation by the formation of the Council of Physical Therapy.

The adoption of Physical Therapy in the curriculum of many important medical centers has practically eliminated the teaching of this branch of medicine from the hands of the itinerary teacher and manufacturer.

The elimination of mysticism and the introduction into the teaching of Physical Therapy by the standard of a critique of pure science

Newer advances, limitations and future problems in the field of radiant energy—therapy.

2. Address—Vital Problems in the Teaching of Physical Therapy

J. C. ELSOM, M. D., Madison, Wis.

In a sense, Physical Therapy is a specialty in medicine, requiring special study, training and technic, but perhaps in no other specialty is a broad conception of medicine and surgery more necessary. The medical college is the obvious source of instruction; teaching problems differ in no essential detail from other subjects, but the method must be thorough, rational, specific and interesting.

SYMPOSIUM ON CANCER—Indications, Limitations and Technic of Electro-Surgical Methods

3. Status of Diathermy in Cancer Therapy

GUSTAV KOLISCHER, M. D., Chicago

4. Selected Surgical Procedures with Surgical Diathermy GRANT E. WARD, M. D., Baltimore

General consideration of the uses of high frequency current in non-malignant surgical conditions. Resume of some experimental work done in an effort to develop a current which will permit operation on parenchymatous organs, without bleeding. Lantern slide demonstration.

5. Palliative Treatment of Inoperable Carcinoma.

JOSEPH K. NARAT, M. D., Chicago

Tumor masses of inoperable cancers should not be left untreated because the toxic products of their abnormal metabolism are the main cause of cachexia; the frequently occurring necrosis of the cancerous tissues produces bad odor and discharge. Surgical diathermy is the method of choice for the removal of tumor masses in inoperable cancers, as it allows a delicate regulation and can be applied with less shock and quicker results than any other method of palliation.

6. The Value of Surgical Diathermy in the Treatment of Tumors of the Bladder. (Illustrated by Lantern Slides.)

A. G. FLEISCHMAN, M. D., Des Moines, Iowa

Source of information obtained by the writer in the preparation of the communication and views of other investigators. Diagnosis of Tumors of the Bladder. Report of 15 cases treated by this method. Details in the technique of the treatment, and advantages gained by Surgical Diathermy. The superiority of this method over any other method at the present time for the Treatment of Tumors of the Bladder.

Discussion of the foregoing four papers by Disraeli Kobak, M. D., Chicago; Clinton K. Smith, M. D., Kansas City, Mo.; Budd C. Corbus, M. D., Chicago; A. L. Yocum, Chariton, Iowa; A. David Willmoth, M. L., Louisville; Vincent J. O'Connor, M. D., Chicago, and Gustavus M. Blech, M. D., Chicago.

SECTION OF MEDICINE—PEDIATRICS—DIAGNOSIS ENDOCRINOLOGY

Thursday, November 3rd, 9 A. M.
SYMPOSIUM ON DERMATOLOGY

1. The Relationship of Physical Therapy to Dermatology
   LYNNE B. GREENE, M. D., Kansas City

2. Physical Therapy in Fungus Disease
   A. F. TYLER, M. D., Omaha, Nebr.
   Brief history of Fungus Diseases. Citation of statistics showing relative frequency in mid-western agricultural area. Brief discussion of pathology. Discussion of the use of physical therapy in conjunction with the other methods of treatment of these diseases.

3. Some Recognized Uses of Ultra Violet Irradiations in Skin Diseases
   CLAUDE B. NORRIS, M. D., Youngstown, O.
   Ultra Violet irradiations have been irrationally used by physicians and others who have had faint conception of its rationale and it is time for the delimitation of its field in therapeutics. Carefully checked scientific observations are safer than enthusiasms. Any favorable effect must be regarded as constitutional and local. Consideration of specific diseases of the skin advantageously treated by this means, with citation of causes and results.

4. The Evaluation of Physical Therapy in Dermatology
   LESTER HOLLANDER, M. D., Pittsburgh, Pa.
   Roentgen ray, ultra violet ray, electro-cautery and cryo-therapy have been potent factors in the development of rational skin therapy. We must bear in mind indications of therapy and these will be given. The talk will be illustrated profusely with lantern slides to show indications for the establishing of physiotherapy. Technique will be outlined, both in talk and formal paper.

5. The Infra-roentgen Rays (super soft x rays) in Dermatology. (Lantern slide demonstration.)
   JOSEPH JORDAS ELLER, M. D., New York
   Discussion of the foregoing papers opened by Erwin P. Zeisler, M. D., Chicago; Francis Senear, M. D., Chicago.

6. The Treatment of Post-febrile Conditions with Special Reference to the Influenzal Type
   BENJ. H. SHERMAN, M. D., Dexter, Iowa
   Septic sore throat, lung abscess, multiple lung abscesses, delayed resolution following pneumonia, bronchitis, especially when accompanied by a severe dry cough. Bronchiectasis.
   Discussion opened by R. W. Fouts, M. D., Omaha, and H. H. Redfield, M. D., Chicago.

7. Infections and Toxemia of the Biliary Tract with Medical and Physical Therapy
   HAROLD M. JOHNSON, M. D., Buffalo, N. Y.
   In physiology there is one statement on which I am going to base many of my ideas. Any agent that causes a hemolysis of red corpuscles increases the flow of bile, therefore, any disease or toxemia which causes a disturbance in the circulatory system must react on the biliary tract or vice versa, any disease of the biliary tract must act or cause a toxemia in the circulatory system which is going to have an effect on the rest of the body.
   Discussion opened by Disraeli Kobak, M. D., Chicago, and Curran Pope, M. D., Louisville, Ky.

8. Some Types of Neuritic Reflex Pains and Their Treatment by Physical Measures
   WILLIAM MARTIN, M. D., Atlantic City
   These painful reflexes may be from a true neuritis or from an irritable nerve, such as perineuritis. Some knowledge of the great nervous system is essential and the local nerve distributions of parts involved. Types of referred pains include torticollis and occipital headaches, painful shoulder, elbow and fingers, precordial pain simulating true angina pectoris, backache, knee joint pains, spasm of the calf muscles and flat foot with painful heel and toes. Method of differentiating these given and a general resume of treatment, with some details of the more particular conditions.
   Discussion opened by J. E. Waddington, M. D., Detroit, and T. B. Lacey, M. D., Glenwood, Iowa.

9. Ultra Violet Radiation in the Therapy of Pulmonary Tuberculosis
   H. H. REDFIELD, M. D., Chicago
   General practitioner versus the Sanitarium. Adaptability for home treatment. Causes of failures in treatment. Classes of cases suitable for radiation. Outline or selection of cases. Method of application of quartz lamp. Water cooled vs. air cooled lamps. Influence of calcium content of blood. Endocrines as accessory treatment. Personal equation in giving radiations.
   Discussion opened by Emil C. Duval, M. D., Chicago, and Ellis Freilich, M. D., Chicago.

Afternoon—2 O'Clock

10. Status of Physical Therapy in Obesity
MAXIMILLIAN KERN, M. D., Chicago

1. Treatment of obesity is one of metabolism and can only be approached from that standpoint. 2. Whether obesity is of the exogenous or endogenous type the considerations are of paramount importance. 3. The use of the x ray as a diagnostic and therapeutic agent in pituitary obesity merits serious consideration. 4. A study of the blood chemistry will frequently reveal a disturbance of the calcium and phosphorus metabolism, and the ultra violet light is the one known agent capable of influencing such conditions. 5. Ovarian conditions producing obesity are frequently influenced by x ray, ultra violet and diathermy alone or in combination.

11. The Perils of Obesity—What Can Physical Therapy Do? J. C. ELSOM, M. D., Madison, Wis.

Alimentary and endocrine causes of obestiy; abnormal deposits of fat are sources of danger and interference to the functions of muscles, circulation, respiration, and to many of the important organs (kidneys, liver, etc.) Exercise and diet have been greatly abused in reduction treatment. The dangers of mail order systems of reducing will be considered; each patient is a problem in himself. Medical treatment is frequently necessary. Use of physical agencies, and some radically different forms of treatment are suggested.

Discussion of the two foregoing papers opened by Curran Pope, M. D., Louisville; Frederick G. Morse, M. D., Boston; J. H. Hutton, M. D., Chicago.

12. Six Years' Experience in the Treatment of Pneumonia with Diathermy
HARRY EATON STEWART, M. D., New Haven, Conn.

Early use. Hospital staff checking of diagnosis and results. Control groups. Use of diathermy abroad. Modification of technique indicated by experience. Possibilities of intensive treatment illustrated by case reports. Present status and indications for the future.

Discussion opened by Lloyd M. Otis, M. D., Celina, Ohio, and Gage Clement, M. D., Duluth, Minn.

13. The Measurement of Ultra Violet Ray
ARTHUR E. SCHILLER, M. D., Detroit, Mich.

Review of literature on the measuring of the density of ultra violet light. The inadequacy of methods of measurement up to the present time shows the need of a method which expresses erythema units in a definite system of measurement. This is important because, with a definite system of measurement, the erythema unit of any lamp either Carbon Arc, Iron Arc, or Quartz lamp may be expressed in terms of definite unit and thus may be repeated as required. The work of Dr. Janet H. Clark on the lithophone unit is reviewed. Lantern slides of comparative erythema and lithophone units will be shown. The value of this method will be self-evident.

Discussion opened by Chas. E. Stewart, M. D., Battle Creek, and Norman E. Titus, M. D., New York City, N. Y.

14. Blending of Physical Agents
J. U. GIESEY, M. D., Salt Lake City Carthage, Mo.

The need for a consideration of the various blendings and shadings of Physical Modalities. Physics and effects of the various modalities more commonly employed. "Aiming"—at the condition to be attacked. The building of the Physical Therapeutic Prescription simple or combined, for single or blended effect in a parallel fashion to the writing of a chemical prescription.

Discussion opened by Edwin N. Kime, M. D., Indianapolis, and W. B. Chapman, M. D.,

15. The Physiological Action of Diathermy in Pneumonia
GAGE CLEMENT, M. D., Duluth, Minn.

A brief discussion of the pathology of lobar and broncho-penumonia. Their clinical and radiological differences and similarities. The effect of heat upon the different infecting organisms. The cause of the crisis in lobar pneumonia. The physiological action of diathermy in aborting pneumonia and hastening recovery. Empyema. A few brief case reports. Lantern slides.

Discussion opened by Chas. Eaton Stewart, M. D., New Haven, and Benj. H. Sherman, M. D., Dexter, Iowa.

16. The Treatment of Diabetes
T. T. GIBSON, M. D., Middlesboro, Ky.

Some of the most probable causes of Diabetes, those organs which have to do with the production of Diabetes Mellitus because they fail to function. The correct blending of different wave lengths of radiation, will restore to health a large per cent of cases of Diabetes.

Discussion opened by A. E. Schiller, M. D., Detroit, and M. J. Breuer, M. D., Lincoln, Nebr.

17. Physical Therapy in Relation to the Endocrine Glands
JAMES H. HUTTON, M. D., Chicago

This paper will deal especially with x ray and radium in the treatment of goiter. Toxic and non-toxic, exophthalmic and adenoma with hyperthyroidism. The same measures directed at the pituitary for the relief of uterine hemorrhage. The treatment of persistent thymus and the x ray exposure of the ovaries for the purpose of rejuvenation and for uterine fibroids.

Discussion opened by Curran Pope, M. D., Louisville, and Maximillian Kern, M. D., Chicago

18. X Ray Diagnosis of Non-Tuberculous Pulmonary Diseases

AARON ARKIN, M. D., Chicago

Importance of x ray in differential diagnosis. Bronchus carcinoma is not a rare disease. Clinical types. Primary and secondary lung tumors. Solitary or multiple sharply outlined shadows in the lung may be produjed by tuberculosis, lymphogranuloma, syphilis, metastases, echinococcus, or benign tumors. Mediastinal shadows in several diseases will be demonstrated.

Discussion opened by A. F. Tyler, M. D., Omaha, and L. A. West, M. D., Des Moines.

SECTION OF SURGERY—GYNECOLOGY—UROLOGY—ORTHOPEDICS

Thursday, November 3rd, 9 A. M.

1. Physical Means in the Correction of Lower Backaches

F. H. EWERHARDT, M. D., St. Louis

The intention of this paper is to present diagnosis and therapeutic measures for the correction of certain lower back pains due to functional causes. Especially those concerned with incorrect posture, faulty position of pelvis, and unbalanced condition of musculature about the pelvic girdle.

Discussion opened by F. H. Walke, M. D., Shreveport, La., and H. E. Stewart, M. D., M. D., New Haven.

2. Status of Physical Measures in the Treatment of Anal and Rectal Diseases

CHARLES J. DRUECK, M. D., Chicago

Physical Therapy is not a substitute for surgery or any other tried procedure, but is a valuable adjunct in selected disturbnces of the pelvic bowel, such as Colo-Proctitis; Fecal Impaction; Rectal and Anal Tuberculosis, Ulcers and Malignancies; Peri-Rectal Abscesses and Fistulae and in the Post-Operative Convalesence.

Discussion opened by A. David Willmoth, M. D., Louisville, and F. E. English, M. D., Saginaw, Mich.

3. Physical Therapy in Gonorrheal Arthritis

JACOB GUTMAN, M. D., Brooklyn, N. Y.

Diagnostic features of gonorrheal arthritis. Frequency of joints involved. Analysis of 388 cases of arthritis. Vaccines. Diathermia. High Wattage therapy in gonococcus infections.

Discussion opened by S. C. Woldenberg, M. D., Chicago, and C. M. Westerman, M. D., St. Louis, Mo.

4. The Use of Radium in the Treatment of Uterine Hemorrhage

HAROLD SWANBERG, M. D., Quincy, Ill.

Uterine hemorrhage is a symptom. Its cause should be ascertained. Causes of hemorrhage are given. Importance of accurate diagnosis. Indications and contra-indications for radium. Properly used, radium is very successful. Construction of radium applicators and technic of applying. Great importance of proper radium dosage. Results of the treatment. Radium versus surgery. Summary. Conclusions.

Discussion opened by Henry Schmitz, M. D., Chicago.

5. Experiments with Diathermy in Surgical Shock

URSUS V. PORTMAN, M. D., Cleveland

Rationale and results of the use of diathermia in the prevention and treatment of surgical shock as investigated at the Cleveland Clinic. Prevention and treatment of post operative pneumonia and collapse of the lung by diathermia.

Discussion opened by Disraeli Kobak, M. D., and Gustavus M. Blech, M. D., Chicago.

6. Newer Concept of the Management of Carbuncles

A. DAVID WILLMOTH, M. D., Louisville

Character of infection, the method of spreading, dangers of carbuncles especially those about the face. Many cases in elderly people and those who are diabetics. Inability of the old method, the use of Carbolic acid to reach all points of infection. The effort to better control infection by the crucial incision. The use of the cautery. The disadvantages of the cautery. The great advantage of the High Frequency currents over any of the other known measures to control infection. No hemorrhage, no shock. Rapid healing. Small and pliable scar.

Discussion opened by J. U. Giesey, M. D., Salt Lake City, and F. L. Nelson, M. D., Ottumwa, Iowa.

7. Present Day Status of Physical Methods in Surgical Diseases

GUSTAVUS M. BLECH, M. D., Chicago

The therapeutic effectiveness of the diverse physical agents in surgical diseases can be properly evaluated only by a combination of clinical observations and theoretic considerations. Diathermy is valuable not only as a means of coagulating tissue, but as a non-operative method in a number of surgical conditions. Resume of indications and contraindications. A similar situation exists with reference to actinotherapy. Its value in certain surgical lesions and conditions, as shown by actual clinical experience.

Discussion opened by Carl Beck, M. D., Chicago, and Grant E. Ward, M. D., Baltimore.

8. Some Experience with the Use of Radium in Urology

LEO C. DUBOIS, M. D., Chicago

The effect of radium on tissue in general. The use of radium in urology. (Historical.) The selective effect of radium on certain types of tissue. The use and effect of stimulating doses of radium on urethral pathology.

Discussion opened by Harry Katz, M. D., Chicago, and Wm. F. Martin, M. D., Battle Creek, Mich.

Afternoon—2 P. M.

9. Bladder Decompression in Prostatic Hypertrophy

EDWIN W. HIRSCH, M. D., Chicago

The reduction in mortality following prostatectomy has in a large measure been due to properly reducing bladder pressure and blood chemistry before operation. This paper details methods advisable and technic used.

Discussion opened by H. C. Rolnick, M. D., Chicago, and A. G. Fleischman, M. D., Des Moines.

10. The Role of Physical Therapy in Osteomyelitis

PHILIP KREUSCHER, M. D., Chicago

Two varieties of osteomyelitis are differentiated: (1) Traumatic; (2) Metastatic. The treatment is vastly different in the individual types. Physical therapy is probably never indicated in the early stages. The focus must be removed; the sequestrum must be eradicated; the infected bone is fully exposed and brought as near the surface as possible. The greatest cause for failure of cure has been in the eradication of the infection from the soft parts. Here physical therapy plays its greatest role.

Discussion opened by Emil C. Duval, M. D., Chicago, Frank H. Walke, M. D., Shreveport, and S. C. Woldenberg, M. D., Chicago.

11. Advantages of Co-ordinated Physical Therapy Urologic Diseases

WALTER F. MARTIN, M. D., Battle Creek

The object of the paper will be to outline the system of practical physical therapeutic methods as used in our daily work. We hope to show that more successful results follow the use of Dietetics, Hydrotherapy, Electrotherapy, Rest and Exercise, when combined and used as a system in the treatment of the patient. Combinations of treatments as used in treating disease entities will be outlined.

Discussion opened by A. E. Jones, M. D., Chicago, and Edwin W. Hirsch, M. D., Chicago.

12. The Therapeutic Value of Diathermy in Urology

LOUIS WINE BREMMERMAN, M. D., Chicago

Although the discussion under this title necessarily must be rather comprehensive we will endeavor to bring to your attention the efficacy of diathermy not only in surgical lesions of the uro-genital tract, but will consider its value in medical pathology. We will offer for discussion various modes of tech nique employed in the treatment of kidney, bladder, prostatic and vesicular lesions.

Discussion opened by A. E. Jones, M. D., Chicago, and A. G. Fleischman, M. D., Des Moines, Iowa.

13. Sinusoidal Currents—Their Mechanism and Effects in Constipation

FREDERICK H. MORSE, M. D., Boston

Alternating and direct sine currents in modern therapeutics. Importance of recognizing physiological action in impaired muscles and neuron when applying methods for restoration of function. Wave current stimulation used for relief of the various forms and degrees of paralysis, including hollow viscera as might apply to infantile and post traumatism and intestinal stasis.

Discussion opened by Mary Arnold Snow, M. D., New York, and J. E. G. Waddington, M. D., Detroit, Mich.

14. The Removal of Hemorroids by Means of the High Frequency Current. (Illustrated with moving pictures).

WILLIAM BIERMAN, M. D., New York City

Advantages of the use of the high frequency current. Its use also in the treatment of associated conditions, polypi, fissures and prolapse. Description of technics employed, coagulation electric clamp, desiccation, fulguration, grounded oudin; results.

Discussion opened by J. U. Giesy, M. D., Salt Lake City, and Chas. J. Drueck, M. D., Chicago.

15. Surgical Diathermy in Accessible Neoplasms

F. L. NELSON, M. D., Ottumwa, Iowa

Discussion opened by Gustav Kolischer, M. D., Chicago.

16. A New Technic in the Use of Diathermy in Pelvic Diseases

CLARENCE M. WESTERMAN, M. D., St. Louis, Mo.
A newly designed belt. Indifferent electrode which can be likened to the rim of a wheel. The active electrode representing the hub and the heat radiation the spokes of the wheel. More concentrated and centralized heat around orificial electrodes in treating pelvic disorders in both male and female by this method.

Discussion opened by A. David Willmoth, M. D., Louisville.

17. Physical Agents in the Treatment of Hemorrhoids and Other Rectal Diseases

F. W. ENGLISH, M. D., Saginaw, Mich.
Physical Agents in the Treatment of Hemorrhoids and Other Rectal Diseases will include the ambulant methods of treating and curing not only hemorrhoids, but a multitude of organic and functional disturbances of this part of living anatomy which heretofore have required strictly surgical methods.

Discussion opened by Frank H. Walke, M. D., Shreveport, La.

18. The Treatment of Bones and Joints with Physical Therapy

FRANK H. WALKE, M. D., Shreveport, La.

Discussion opened by Emil C. Duval, M. D., Chicago.

SECTION OF EYE—EAR—NOSE—THROAT ORAL DISEASES

Thursday, Nov. 3—9 A. M.

1. The Treatment of Sinus Infections by Physical Agents

FRANK T. WOODBURY, M. D., New York City
Acute sinusitis, symptoms, signs. Chronic sinusitis, symptoms, signs. Etiology Nasal and constitutional; predisposing and exciting. Prevention by physical agents. Treatment by physical agents. Report of cases.

Discussion opened by Frank J. Novak, Jr., Chicago.

SYMPOSIUM ON THE EAR

2. Physical Therapy in Diseases of the Ear

FREDERICK L. WAHRER, M. D., Marshalltown
Careful differential diagnosis is essential to successful treatment. Middle ear disease is potentially dangerous and should receive careful consideration. Middle ear disease is secondary to nose and throat infections. Causative factors must be eliminated before treatment will be successful. No patient should be subjected to mastoidectomy until other methods fail. Physical therapy is not a substitute for other methods. It is an adjunct of great value.

3. Skin Affections of the External Ear

LOUIS SAVITT, M. D., Chicago
Etiology and pathology. Complications. Review of methods of treatment in vogue. Use of radiant heat-light. Action of ultra violet radiation. Dosage and technic. Case reports and lantern slide demonstrations.

4. Radiotherapy in Selected Cases of Chronic Ear Suppurations

IRA O. DENMAN, M. D., Toledo, Ohio
Chronic Aural Suppurations favorably influenced by irradiation. First, those described in previous article in which patency of Eustachian tube is re-established by resolution of lymph-oedema in naso-pharynx, particularly the fossa of Rosenmueller. In this x ray plays leading role. Second, Chronic suppurations with patent tube. Necrosis—the Scarlet Fever type, correllation of stimulative x ray doses and ultra violet rays.

5. Chronic Otorrhea—Its Management with Zinc Ionization

HAROLD L. WARWICK, M. D., Ft. Worth, Tex.
Zinc ionization alone will not result in a permanent cessation of symptoms in every case of suppurative otitis media. Cases should be carefully selected and other foci about the head should be cleaned up. The technique presents no difficulties from physical standpoint. The apparatus is rather inexpensive and the results are uniformly good in selected cases.

6. Further Experiences with Diathermy and Negative Galvanism in Partial Deafness

A. B. HOLLENDER, M. D., and
M. H. COTTLE, M. D., Chicago
Review of preliminary report in Archives of Otolaryngology of April, 1926. A more extended use of the audiometer in diagnosis and check-up of progress made. Improved electrodes and technic. Report of over one hundred consecutive undifferentiated cases treated; results; conclusions.

Discussion of the foregoing five papers by S. T. Rubley, M. D., Grand Rapids, Mich.; Ellis G. Linn, M. D., Des Moines; Harry G. Thometz, M. D., Chicago, and Frank J. Novak, Jr., Chicago.

7. The Application of Physical Measures to the Head

WILLIAM A. LURIE, M. D., New Orleans, La.

Discussion opened by M. H. Cottle, M. D., Chicago.

A "pioneer spirit" is required to use physical means. The effect of this form of treatment is so different

from the older forms that one may suspect a mistake in diagnosis was made or that pathology is changing. Our conception of pathology should be altered to conform to treatments by physical means.

8. Physical Aids as Adjuncts in the Treatment of Certain Eye, Ear, Nose and Throat Conditions

H. L. BROOKS, M. D., Michigan City, Ind.

Radium therapy for malignant growths involving the eyeball or orbital cavity. Status of radium therapy for cataracts. Roentgen ray for catarrhal deafness when there are marked lymphoid masses in the neighborhood of the fossa of Rosenmuller. Diathermy stimulates healing and resorptive tissues reaction. Use of zinc ionization in suppurative otitis media.

Discussion opened by Thomas C. Galloway, M. D., Evanston, Ill.

Afternoon—2 O'Clock

9. Technique and Application of the Wave Length in Dentistry

C. B. HOLMAN, D. D. S., St. Louis, Mo.

Action of the different length of Ultra Violet Rays on gum tissue. Analgesic properties. Bleaching properties on Tooth Structure. Post Operative Lesions. Bone infections—how applied in Antrum conditions. Facial Neuralgia and the possibility of using the mouth in administering treatment for systemic conditions.

10. Ultra Violet Rays in Dentistry

WALTER MAYLAND, D. D. S., and
GEORGE F. PURVIS, D. D. S., Chicago

A resume by the authors of positive and negative results over a period of four years. Practical demonstration of technique with dry skull; also report of comparative results in treatment of pyorrhea with and without air-cooled therapy.

Discussion of the foregoing two papers by W. A. Lurie, M. D., New Orleans.

11. Epithelioma of the Lip and Its Treatment with Radium

FRANK EDWARD SIMPSON, M. D., and
ROY EMMERT FLESHER, M. D., Chicago

The diagnosis of epithelioma of the lip. Methods of treating the lip lesion. Methods of treating the lymph nodes of the neck. Advantages and disadvantages of radium or radon treatment. Technic of treatment. Results.

Conclusions: Radium or radon in large quantities is the method of choice in lip epithelioma. The use of at least 1000 millicuries of radon is necessary for the best results.

Discussion opened by C. W. Hanford, M. D., Chicago; A. F. Tyler, M. D., Omaha, and Harold Swanberg, M. D., Quincy.

12. Electrocoagulation of Tonsils — Technic: End Results

GREGG A. DILLINGER, M. D., Pittsburgh

Electrocoagulation of tonsils in use in France for fifteen years or more in cases in which tonsillectomy is contraindicated. Results in over 200 caess. Technic very important factor. Certain features make it appeal to patient.

Discussion opened by Frank J. Novak, Jr., M. D., Chicago, and Raymond F. Elmer, M. D., Chicago.

13. Suction Tonsillectomy

J. B. H. WARING, M. D., Blanchester, Ohio

The operation, particularly from the standpoint of the physiotherapist. The proper equipment for this operation will be pointed out in more or less detail as also the proper usage of equipment in local and general anesthesia. Conclusions.

Discussion opened by Frederick L. Wahrer, M. D., Marshalltown, Iowa, and H. L. Brooks, M. D., Michigan City, Ind.

14. Diathermy in the Head Specialties

ELLIS G. LINN, M. D., Des Moines, Iowa

A helpful adjunct in acute head conditions, congestive and infective. Palliative and curative. Generally applicable. Valuable as rejuvinating factor in mucous membrane and submucous cellular structure atrophies. Supportive in actinic mucous membrane therapy. Treatments accurately delivered, not too prolonged, not too limited in contact area.

Discussion opened by Wm. A. Lurie, M. D., New Orleans.

15. Ultra Violet Ray in Asthma

H. B. WILMER, M. D., Germantown, Pa.

The importance of the use of ultra violet ray and the infra red ray in the treatment of asthma will be shown by report of a series of cases showing the different types and the method of treatment with the ray.

Discussion opened by A. R. Hollender, M. D., Chicago, and A. E. Schiller, M. D., Detroit.

JOINT SESSION

Friday, November 4th, 9 A. M.

1. Physical Therapeutics in Curriculum and Clinic

EDWIN N. KIME, M. D., Indianapolis, Ind.

Principles and methods of teaching: A. Undergraduate students of medicine; B. Post-graduate

students. (a Internes and resident physicians. (b) Practicing physicians. C. Non-medical assistants: (a) Student nurses. (b) Lay assistants.

Discussion opened by Norman E. Titus, M. D., New York, and Disraeli Kobak, M. D., Chicago.

2. The Therapeutic Effects of Heat from Various Sources

JOHN HARVEY KELLOGG, M. D., Battle Creek, Mich.

Heat is one of the most potent and most generally applicable of all forms of physiotherapy. It is the dominant factor in most hydriatic applications, and an active element in many forms of phototherapy. Heat kills pain. For highest efficiency it must be applied in an intensive manner.

Discussion opened by J. E. G. Waddington, M. D., Detroit, and Frank T. Woodbury, M. D., New York.

3. Clinical Experiences with Artificial Sources of Light in the Handling of Complications of Pulmonary Tuberculosis

EDGAR MAYER, M. D., Saranac Lake, N. Y.

Physiological absence of light Comparisons of Carbon Arcs and Mercury Quartz Lights. Clinical effects in lymphatic tuberculosis, intestinal and peritoneal tuberculosis, and laryngeal tuberculosis with technic of exposure as derived from personal clinical experience.

Discussion opened by Dean W. Harman, M. D., Ames, Iowa; R. T. Pettit, M. D., Ottawa, Ill., and Ellis Freilich, M. D, Chicago.

4. Massage—Principles and Practical Application (Illustrated).

CURRAN POPE, M. D., Louisville

The basic principles of massage will be treated as well as the mechanical methods of manual and mechanical massage. Lantern slides will be shown, giving a pictorial illustration of the movements and also massage of the various portions of the human body. The simplicity and value of this agent will be considered.

Discussion opened by F. H. Ewerhardt, M. D., St. Louis.

5. Muscle Training in Spastic and Flaccid Paralysis

JOHN S. COULTER, M. D., Chicago

Importance of attempts to drive motor impulses from brain to muscle. Massage and electricity should only be used in these cases with muscle training.

Discussion opened by Frederick H. Morse, M. D., Boston.

6. Phototherapeutic Facts and Fallacies

J. E. G. WADDINGTON, M. D., Detroit

Health depends upon a normal appropriation of a balanced spectrum. In disease, however, it may be necessary to increase or decrease the constituent proportions of the chemical, chromatic, and caloric ensemble. Superior clinical results demand a superior knowledge of the physics and physiology underlying all the integrant factors.

Discussion opened by W. E. Howell, M. D., Chicago.

7. Diathermic Penetration from the Clinician's Standpoint.

H. D. HOLMAN, M. D., Mason City, Iowa

Heat in relation to deep-seated lesions. Case reports. Equipment for conversive heat. Clinical work, in combination with the research laboratory, should enable us to select the best equipment. With heat playing such an important part in relation to the deep-seated lesions, it is readily seen why it is so important to establish the exact degree to which we get thermal penetration, by means of diathermia.

Discussion opened by S. C. Woldenberg, M. D., Chicago.

8. High Lights in the Past Year's Physical Therapy Literature GEORGE B. LAKE, M. D., Editor Clinical Medicine, North Chicago, Ill.

Physical therapy has gone forward with a rush for the past ten years. The underlying reasons for developing niceties of technic are being investigated. Electrotherapy in its various branches continues to hold the center of the stage, and hydrotherapyq, vibration, massage, mechanotherapy and therapeutic exercise are too much neglected. Portable apparatus of all sorts is rapidly being developed so that physical therapy can be taken to the patient's bedside. More space in all medical journals is being devoted to articles on physical therapy, which is taking its proper place as a part of scientific medicine.

Afternoon—2 O'Clock

9. Physical Therapy in Forms of Arthritis

WILLIAM BENHAM SNOW, M. D., New York

Diagnosis of types of arthritis. Traumatic arthritis. Its treatment by the static current. Arthritis of focal origin. First, removal of foci; then joint use of diathermy with the static current to remove infiltrations and fluids from the joint. Rheumatoid arthritis. As a rule of intestinal origin. Treatment by colonic irrigations, radiant light and heat and the static current. Conclusions.

Discussion opened by John Stanley Coulter, M. D., Chicago, and Chas. E. Stewart, M. D., Battle Creek, Mich.

10. Hypersensitiveness to the Action of Physical Agents, Such as Light, Heat, Cold and Mechanical Irritation

W. W. DUKE, M. D., Kansas City, Mo.

A rather large number of individuals become sensitive to the action of light, heat, cold, or mechanical irritants and highly sensitive cases react violently to relatively small doses of the agent to which they are sensitive. Patients of this class can be given tolerance for such agents so that they can stand normal exposures.

Discussion opened by Prof. Victor E. Levine, M. D., Omaha, and A. R. Hollender, M. D., Chicago.

11. The Measurement of Quantitative Biological Effects of X Rays CHARLES PACKARD, M. D., Columbia University, New York City

The biological effect of x rays on the eggs of the fruitfly, Drosophilia, is proportional to the intensity of the beam. Wave length (within the limits tested) is not important. The amount of effect is determined by the per cent of eggs hatching after exposure. This is remarkably constant under similar experimental conditions.

Discussion opened by Albert Bachem, Ph. D., and R. W. Fouts, M. D., Omaha.

12. The Effect of Ultra Violet Light on Food

PROF. VICTOR E. LEVINE, Creighton University, Omaha, Nebr.

Physical and chemical effects of ultra violet rays on carbohydrates, fats and proteins, on enzymes and on vitamins. Irradiation of foods in general and of oils and fats in particular will be stressed, and special attention will be paid to sterols like cholesterol and ergosterol. Theory to show the relation between gastro-intestinal activity, calcium, absorption and ultra violet rays. Anemia, rickets, tetany, hypoacidity, and anacidity will be discussed in the light of theory.

Discussion opened by Prof. Arnold B. Luckhardt, University of Chicago.

13. The Transmission of Ultra Violet Light through Human Skin

PROF. ALBERT BACHEM, University of Illinois College of Medicine, Chicago

Penetration of light through the skin not sufficiently well known. Increasing physiotherapeutic use of light in many diseases and increasing number of hypotheses to explain biological effects of the irradiation. The penetration was measured by use of a mercury quartz lamp, a Hilger Quartz Spectograph and a special photoelectric cell. The measurements were made with specimens of whole skin, isolated epidermal layers, Keratotic growth, subdermal fat, preparations of melanin, lanolin, earwax, blood serum, plasma, and finally fascia. Results and conclusions.

Discussion opened by Prof. A. C. Ivy, Northwestern University, Chicago.

14. Visual Teaching in Electrotherapy (with demonstrations and Lantern Slides).

RICHARD KOVACS, M. D., New York

Visualization of physics and mode of action of various currents essential for rational therapeutic application. Charts. Readily performed experiments and demonstrations with galvanic faradic, sinusoidal, diathermy and static currents.

Discussion opened by Edwin N. Kime, M. D., Indianapolis, and J. S. Coulter, M. D., Chicago.

HOSPITAL CLINICS

Cook County Hospital

Lutheran Memorial Hospital

American Hospital

Michael Reese Dispensary

Wesley Hospital

Northwestern University Medical School

Rush Medical College

The details regarding these clinics have as yet not been definitely arranged, but final announcements will be made in due time. The clinics will comprise work in practically all of the specialties and will be so arranged that conflicts will be avoided so far as possible. In order to facilitate matters, a clinic registration booth will be maintained at the meeting and only such numbers will be registered as can be conveniently accommodated.

Be Sure to Ask for a Certificate when Purchasing Your Railroad Ticket.

RAILROAD CERTIFICATES

As a final reminder to those who intend to come to the Clinical Congress, let us at this time emphasize the importance of asking for a Certificate when purchasing railroad tickets. Our experience in the past has taught us that many physicians are careless and indifferent to this request. We have arranged with the railroads to have them grant "fare and a half rate" for the round trip, but in order to obtain this special concession 250 Certificates must be on hand. The attendance last year warranted 500 Certificates, yet there was a shortage when the totals were made. This year we are giving this advance information and trust that Fellows and others will remember to secure a Certificate at the time their railroad ticket is purchased.

SECTIONAL PROGRAMS

A FEATURE OF CLINICAL CONGRESS

Register Early!

A special feature which is again being carried out at this year's clinical congress is that of sectional programs. Thus there will be sections on medicine and its allied branches, surgery and its allied branches and otolaryngology and oral surgery. This division of the program met with great favor last year and it is for this reason that it is being adopted again. It enables a physician who is interested in medicine only to concentrate his time in this one section. It also enables the specialist in urology to confine himself to the surgical section. The specialist in eye, ear, nose and throat diseases need not waste a moment, as the program in his special section will keep him well occupied and indeed well interested in a variety of papers that should bring about some heated discussions.

In fact the calibre of the entire program is of such a nature that the favorable impressions already made speak for an unusually large attendance. The convention committee takes this means to urge Fellows who are going to enroll for the instruction classes to do so by mail as soon as possible. While the facilities this year will be much improved, it is extremely difficult to register eight hundred or a thousand physicians in one hour's time. Therefore, a determined effort it being made to obtain as many registrations as possible through the mails.

An application blank has been provided on the last page of each program. Fill in this blank and forward with your check to Convention Committee, American College of Physical Therapy, Suite 820, 30 N. Michigan Ave., Chicago. Checks should be drawn to the order of the College.

IMPORTANT CORRECTIONS

I have noticed with delight that in the *Archives of Physical Therapy, X Ray, Radium* much space is devoted to physical principles and physical facts which underly therapeutic methods. I am sure that members of the College of Physical Therapy as well as other readers study these articles intensely, because everyone feels that one has to renew and improve his knowledge on these difficult and often neglected facts. On the other hand there exists the danger that—due to a limited knowledge in physics—errors occur, which might give a wrong impression to the uninstructed reader or even puzzle the more experienced until more accurate data is carefully presented. It is only from this point of view that I should like to correct some of the numerous errors in physics upon which I have stumbled in reading the latest issues of the *Archives*.

In the January number, page 17, you will find that the electrons "vary from 770 in the hydrogen atom to 150,000 in the atom of mercury." Every physicist knows perfectly well that the neutral hydrogen atom contains one electron only, and that the neutral mercury atom holds 80 electrons outside of the nucleus and about 20 inside of it, varying with the atomic variety.

On the same page you can read that an "ion is an electrically unbalanced atom—nothing else under the sun." Yet, there are other ions under the sun and plenty of them; there are e.g., electrically unbalanced molecules of oxygen, O_2, nitrogen, N_2, carbon dioxide, CO_2, and hydrogen, H_2, etc., in the x ray tube of the gas type; and the positive ones of these molecules play the important role of supplying electrons for that kind of tube after their destruction near the kathode. In electrolytes we have another class of ions, namely those acid radicals, as SO_4 or CR_2O_7, or the basic ion NH_4, known as the ammonium radical. I should also like to consider the free electrons in a metal wire and the electrons in a kathode tube, and the positive carriers of canal rays as ions; I even dare to call the alpha and beta particles ions, because it has been proved that they carry electric charges and are set in motion and that their motion can be altered by electric forces.

This last conception does not agree with that of the author of another article in the January issue, page 30, who claims that "the alpha rays are of relatively long wave length." Alpha rays have no wave length and cannot have any, because they are of no undulatory character, but an irregular corpuscular movement.

In the following phrase of the first mentioned paper, page 17, you have to turn everything around in order to make it right. Please replace negative charge by positive charge; read negative pole instead of positive pole; temporarily negative instead of positive; positive pole instead of negative pole; finally, an-ions instead of cations, and cations instead of an-ions will make the next phrase all right.

Furthermore, on page 18 is, "from the electrical standpoint the human body no more than a bag of skin containing chemical salts in solution—hence an electrolyte?" Yes, the body is an electrolyte, but a good deal more; there are colloids suspended in the electrolyte and various electrolytes are separated by membranes with different and variable permeability, and conductivity and so on.

Similarly let me correct the conception that the current is nothing else but ion migration. That conception is correct for the use in phoresis and other kinds of electrolysis, but it is of very little value in other realms of electricity. In diathermy and the production of light we had better forget everything about the ion migration and consider the current as a transformation of electromagnetic energy into heat; and in dealing with transformers, generators, and motors, we had better put in the foreground the electromagnetic properties of the current with their inductive power.

The derivation of the term phoresis—by the same author—from the Greek word *rheo* = I flow, page 20, does not meet my approval. I still consider this word derived from phoreo = I carry.

I do not think that the terms Volt, Ampere, Ohm, should be defined in a paper on practical physiotherapy, for the same reason that one would not determine those units as Gram, Centimeter, Second, each time they are made use of in technics. If one decides, however, to do so, one should do it correctly. The Volt is not determined empirically by the Daniell element, as one may take from page 90. The Volt, as the practical unit of potential is determined by the induction law; therefore it is not based upon an arbitrary electrical experiment, but chosen so as to connect with the centimeter-gram-second-system. The Ohm is not "the resistance of a current of mercury one meter high and one millimeter thick." Neither is the Ampere derived from the Volt and Ohm definition; it is just the opposite. The Ampere is determined by the electromagnetic force of the current, and thus is connected also with the CGS-system; from both Volt and Ampere, the Ohm is derived, by Ohm's law. It has been determined empirically that one Ohm corresponds to the resistance of a mercury column of 106.3 cm. (not one meter), and a cross section of 1 mm^2 at 0^0C.

There are a few minor mistakes which I desire to correct before they are misquoted in the literature:

Roentgen's discovery dates from 1895, not 1896, as erroneously stated, page 56.

The discovery of radium was in 1898, not 1899, as asserted on page 30.

In neither case should I call the discovery accidental. In the case of radium it was the systematic search for an element which made uranium ores even more radioactive than uranium itself. And in the case of Roentgen rays it was the study of the production of rays from the Kathode ray tube which interested a score of physicists and finally led to Roentgen's discovery.

The limitation of the visible light is another point which should be cleared. Page 56, you find these limits given as 4,000 and 8,000 Angstrom units. Although these figures are not incorrect, they represent a rather crude approximation to the actual figures, 3900 Angstrom units and 7600 or 7700 Angstrom units. In a spectrum there is no below and above as well as no right or left; longer and shorter waves, higher and lower frequencies are the only useful terms. The terms "above the violet" and "below the red," as used in this article, are easily misleading.

I have only mentioned a few of the physical errors which I stumbled upon. It is my impression that these and further mistakes can be prevented if the authors go back to original articles and to good textbooks about x ray, radium, atom theory, etc., instead of using the literature of non-physicists, for the fundamentals of science.

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TRAVEL STUDY CLUB OF AMERICAN PHYSICIANS

The Travel Study Club of American Physicians announces a Study Tour for 1928 to Spain, the Riviera, northern Italy, Budapest, Vienna, Munich and Bavarian health resorts, Berlin and Hamburg, visiting clinics and medical institutions.

The Tour starts June 30, 1928, and will take two months. Dr. Fred H. Albee of New York is president, and Dr. Richard Kovacs of 223 East 68th street, New York, to whom inquiries for further details may be addressed, is secretary.

THE STUDENT'S LIBRARY

BOOKS REVIEWED

A PRACTICE OF PHYSIOTHERAPY, *C. M. Sampson,* M. D. 620 pages. Illus. Cloth, $10.00. St. Louis; C. V. Mosby Company, 1926.

This is both an enlarged and improved book over the original one which appeared a few years ago. While the style of the author is far from dignified, nor the personalities quite in order, there is a wealth of information here which would better fit the doctor or technician with at least some experience in physical therapy. There is no doubt that with all the criticism one could make of Sampson's book—one would have to ask—where is there a better one?

It is indeed regrettable that Sampson saw fit to deviate from the conventional plan of writing. How much better it would be and how much smoother it would read as a scientific work.

The apparent over-enthusiasm which has frequently been mentioned could easily be excused for no book on physical therapy would be worth much if its contents did not strike a note of over-enthusiasm.

Sampson definitely portrays that he knows the subject. He as definitely portrays an individuality in manner of presentation which only those who know him can fairly evaluate.

THE CONQUEST OF DISEASE, *Thurman B. Rice,* M. D. Macmillan, New York, 1927. Pp. 363.

Unfortunately the reviewer sees little value in this volume from the standpoint of practical application for the individual. True, the record of accomplishments which is set out is in a large measure based on the experience of the author and no doubt serves its purpose along the lines of recording work done. How this would tend to benefit the one who hoped to gather information by means of which he would benefit the individual is not clear. Preventive medicine should always be considered from the point of view of the individual. In this manner it usually serves its maximum effect.

It should not be overlooked, however, that the specialist in public health will find in this book many facts, practical and enlightening, which when properly classified, cannot but help be of value in the preparation of talks and papers dealing with problems of communal health.

The charts such as contained in the book are strikingly interesting and at once show extended effort on the part of the author in the compilation and writing of the text.

INTERNATIONAL ABSTRACTS

Ostite Destructive Non-Tuberculeuse A Foyers Multiples et Circonscrits, Robert Hanson, Acta Radiologica, Vol. VIII, Fasc. 1, 28:II 1927, N:0 41.

The author gives an account of 3 cases of a multiple form of circumscribed destructions in the bones of the hand and foot which clinically and roentgenologic ally have so much in common as to be appropriately considered to belong to a separate group of diseases. The feature common to all three cases is the occurrence of well circumscribed areas of destruction in the wrist-bones of both hands. In the first two cases there are destructive areas also in the phalangeal bones of the foot or in the heads of metatarsal bones.

The circumscribed changes as seen on roentgenograms resemble to a certain extent those described by Jungling and others as occurring in the multiple forms of tuberculous, cystic osteitis. The author's cases are of infectious nature, tuberculosis, lues, gout and fibrous ostitis having been carefully excluded.

A number of authors have included in "ostitis multiplex cystica" also those circumscribed diseased areas in the bones of hand and foot occuring in "lymphogranulome benin" or lupus pernio. This condition is well defined clinically as well as roentgenologically and the author is therefore of the opinion that it should be classed as a separate disease: Benign lymphogranuloma.

The author further considers the name "ostitis multiplex cystica" inappropriate also for the other cases described as in most of them there is no question of any bony cysts.

With these three cases the author wishes to illustrate that bony changes resembling those described in "ostitis multiplex cystica" and which have been considered due to tuberculosis, may also occur after other infections.

The author suggests this separate diseased condition to be called *multiple circumscribed ostitis* or "ostite destructive a foyers circonscrits multiples".

The Radium Treatment of Haemangiomata Lymphangiomata and Naevi Pigmentosi, Gunnar Andren, Acta Radiologica, Vol. VIII, Fasc 1, 28:II 1927, N:0 41.

After briefly reviewing the radiological treatment of naevi the author gives an account of their pathology and clinical manifestations. An account is given of the technique of treatment in general and that employed at "Radium-hemmet" in particular. During 1909—1924 treatment and careful re-examination has been carried out at "Radiumhemmet" of: 288 cases of haemangioma, 11 cases of lymphangioma, and 69 cases of epidermal naevi. The experiences gained from the treatment will be found recorded under the heading "Summary of Therapeutic Results."

Zur Therapie Des Hautkrebses, Dr. J. Wetterer and Dr. F. Gaa, Acta Radiologica, Vol. VIII, Fasc. 1, 28:II 1927, N:0 41.

The author describes a case of carcinoma of the skin—over 300 larger and smaller nodules of a type little sensitive to irradiation (adenogenetic cancer with only little tendency of growth) distributed over scalp, face, ears, throat and neck—where he succeeded in removing every nodule with a cosmetically excellent result and in completely restoring the patient, who had already become somewhat cachectic; this treatment consisted of a combination of fractional irradiation by roentgen rays, injections of blood serum and glucose and prolonged, deep electrolysis.

Influence of Diathermy on Gonorrhea, P. J. Van Putte, Acta Dermato-Benerologica, June 2nd, 1926.

The author shows that the gonococcus resists high temperatures of the body raised by diathermy to about 99-degrees F. Contrary to American views he decries the value of diathermy in acute gonococcal urethritis as nil. But he is extremely enthusiastic about diathermic therapy in chronic gonorrhea.

He has seen cures in many chronic cases with but one treatment and without resort to any other measure

whatever. While in a few it was necessary to resort to a few irrigations with potassium permanganate in order to obtain a cure.

Van Putte does not regard the heat per se as the cause of death of the gonococci, but wants it to be regarded as a stimulation for the formation of antibodies.

The Treatment of Anginal Pain and Raised Blood Pressure by Diathermy, John Kay, M. D. and Phoebe Ince, M. D., The Lancet, No. 16, 1926.

The authors recommend in all cases of angina pectoris and high blood pressure diathermy of the chest. They have seen almost exclusively improvement of the subjective phenomena and have been able to restore patients to a degree of usefulness.

They have observed that blood pressure often becomes diminished and remains so for sometimes after the completion of a course of treatment. In no instance have the authors seen any ill effects from the treatment with diathermy, the only drawback that the diathermic applications must be continued for several months.

Diathermy in the Production of Deep Temperature, Ralph Boerne Bettman, M. D. and Nathan N. Crohn, M. D., J. A. M. A., February 19, 1927.

After defining diathermy and reviewing some of its historical interests, the authors describe in detail numerous experiments which they performed and give their results. Several illustrations are shown. Summarizing their work these authors say:

Skin effect is a factor in clinical diathermy; just how important a factor we are at present unwilling to state.

The production of heat is commensurate with the localized density of the current.

It is possible to focus the site of heat if it is possible to constrict at a given locality the lines of current. With the present day routine application of the electrodes, it seems impossible to focus the site of heat in any given internal viscus.

Factors pointing against a central heating of tissues include a consideration of:

1. Current density, which is ordinarily greatest near electrodes, regardless of the frequency or the nature (whether direct of alternating) of the current.

2. Skin effect, which is dependent on relative specific resistance and specific conductivity of tissues. It is probable that this is a factor in keeping the current near the surface of the body.

3. Heat equilibrium of the body, which tends to prevent lasting deep local heating.

4. Failure to demonstrate experimentally actual localized deep tissue heating.

The indiscriminate placing of equal sized electrodes opposite each other does not guarantee the actual concentration to any great extent of a material amount of high frequency current, and under such conditions we question the ability of diathermy to raise appreciably the temperature of a selected deep organ in the chest or abdomen.

As to the value of the employment of diathermy in extremities in such conditions as fractures or arthritis, when it is believed that heat with its resultant hyperemia will beneficially affect the physiology or pathology of the part, it is probable that to some extent a more efficient heat can be applied to the bone surface by means of diathermy. For such purposes, appropriate application of the electrodes is necessary.

When the two electrodes are placed on opposite sides of the chest or abdomen, as is usually practiced in clinical diathermy, it is our opinion that the greatest amount of heating takes place near the electrodes and that the deeper portions of the body receive a proportionately small amount of current.

The Effects of Polarized Light on Bacterial Life, R. B. Lal, M. B., etc. and K. N. Mathur, M. Sc, The Indian J. of Med Research, Oct., 1926.

Bacterial life is generally known to be subject to considerable variations under conditions, amongst others, dependent upon changes in their environments regarding temperature and humidity. Baly and Semmens have recently demonstrated increased rate of hydrolysis of starch under polarized light as compared with that under unpolarized light of the same intensity. Since a good proportion of moon light and a fair amount of sun light under certain circumstances is polarized in nature it was thought that a study of the effects of polarized light on bacterial life would be of considerable interest.

A preliminary report was made in *"Nature"*, in October last year, by Bhatnagar and Lal. A similar work had also been done by Macht and Hill. The

present series of experiments were conducted with *V. cholerae* and *B. coli communis*.

The results obtained by testing the growth of the organisms are invariably in the same direction, viz., increased growth under the influence of polarized light as compared with that under unpolarized light of the same nature and intensity. The magnitude of the difference in the two cases, as evidenced by the plating method, is very remarkable, and brings out very prominently the great stimulating influence of polarized light on those organisms.

The results reported here with *B. coli Communis* or as previously published for *B. Typhosis* and those indicated by Macht and Hill with *B. coli communis* and *B. typhosis* and also those obtained with *B. dysenteriæ* (Flexner) and other organisms to be dealt with in another paper, suggests that the remarks made here for *V. choleræ* would apply equally to the spread of diseases caused by the coli typhoid group of organisms. The question of certain other biological changes in the bacteria such as in their immunity reactions and virulence is intimately connected with the problem of their epidemicity. The studies of changes in agglutinability of *V. choleræ* grown under polarized and unpolarized light have not so far shown any appreciable difference in the two cases and further work on these lines is in progress.

X Ray Treatment of Epithelioma, G. W. Grier, M. D., New Orleans M. and S. J., Jan,, 1927.

By the fractional dose method, a gradual involution of the lesion takes place as a result of the progressive destruction of the cancer cells. This occurs without destruction of the normal tissues in the region because cancer cells are usually more susceptible to radiation than the normal cells. The objections to this method of treatment are that some lesions will not heal, probably because the cells of that particular lesion are more resistant and recurrences are more common after healing. As a cause of these recurrences, I offer the theory that the lesion will heal over when most of the cancer cells are destroyed but that a few cells which are left remain vital and regenerate the lesion at a subsequent period. With the massive dose method of treatment, such a large dose is applied that the entire lesion including a margin of normal tissue is destroyed and sloughs away. The resulting wound heals by granulation By this method, very few lesions fail of destruction and recurrences seldom happen, except when too small an area is treated and a few vital cancer cells are left in the margin of the wound. It might be asked if recurrences only happen when too small an area is treated, why not always include a wide margin of normal tissues around the lesion? The answers to this is that the treatment always creates a sloughing wound and the larger the wound the more difficult it will be to heal up. Where such a wound ¾ inch in diameter heals readily one which is two or more inches across might give considerable trouble. For this reason, any unnecessary exposure of normal tissue around the lesion is not desirable. A margin of ⅛ inch of what appears to be normal tissues around the lesion is allowed.

The author describes in detail the massive dose method which he employs. In 1921 he reported 315 cases of superficial malignancy which had been treated by this method. There were 26 recurrences in that series, 18 of which were cured by subsequent radiation.

In conclusion the author states:

Epithelioma of the skin is most successfully treated by an escharotic dose of totally unfiltered radiation. This dose may be given at one sitting or subdivided into two, three or four treatments. If subdivided, the interval between treatments must be so short that there is little or no loss between treatment, the effect being practically that of a single dose.

The Roentgen Ray Treatment of Skin Cancer and Allied Conditions, Fred M. Hodges, M. D., Virginia Medical Monthly, Feb., 1927.

In the treatment of all skin cancer we believe the size, character, location, and thickness of the growth must determine the amount of irradiation to be used. A small superficial basal-cell epithelioma will be cured with one erythema dose. A thick infiltrating basal-cell lesion or a squamous-cell growth of any size may require several erythema doses of unfiltered and filtered irradiation combined.

The growth is destroyed by the direct action of the ray on the cancer cells themselves and by the reaction in the surrounding normal tissues caused by the irradiation. In lesions less than approximately four centimeters in diameter, as a rule, the normal tissues will completely recover following very large doses of irradiation; but in larger areas large doses, especially if repeated, may cause an ulcer which will not heal and this must be guarded against when treating large growths. This is a rare complication and will not occur if the correct technic is used.

A biopsy is done only when we have a large lesion to deal with, since no matter whether it is of basal or squamous-cell origin we endeavor to give a large

enough dose of x rays to entirely eradicate the lesion. If a biopsy is done, it is followed immediately by irradiation; or if periosteum or bone is involved, the case is referred for surgery.

The cases are carefully chosen and thoroughly treated, the roentgen ray offers as good results in the treatment of skin cancer as any other method and in lesions around the eyes and over the nose it is superior to any other method.

The Palliation of Inoperable Cancer, Joseph K. Narat, M. D., Illinois M. J., Feb., 1927.

In the absence of definite knowledge concerning the nature and origin of cancer the only effective treatment promising cure is surgical removal of the growth. Within the last few years three other useful agencies have been added to the armamentarium, viz.: the x ray, radium, and surgical diathermy. However, one item in the treatment of cancer which does not appear to have been given the emphasis it deserves, is the palliation of cases where a radical operation is impossible. The purpose of this paper is to create in the medical profession the feeling that even in incurable cancer cases much can be done for the patient without resorting to uncertain or useless agents and remedies. A fatalistic point of view and a therapeutic nihilism of the licensed physician drive the unfortunate victim of cancer to quacks and charlatans.

Whatever may be the precise value of the nutritional theory of cancer genesis, enough evidence has been adduced to demonstrate that metabolism plays a certain role in the development of cancer. Therefore, much stress should be laid upon the systemic treatment of the incurable cancer and the necessity of building up the resistance of the cancer carrier.

It cannot be too strongly emphasized that only an early operation or radiotherapy give fair chances for a radical cure of cancer. In inoperable cases the task of prolonging the life of the patient, of relieving his pain, and of eliminating the discharge and fetor can be accomplished by means of various chemical and physical agents. Of vital importance are periodic health examinations. A widespread lay education on the cancer problem will limit the necessity of palliation and make more cases of cancer amenable to successfud surgery or its substitutes.

Radium Treatment for Cancer of the Cervix, O. D. Hall, M. D., The J. of the M. A. of Georgia, Jan., 1927.

The conclusions of Hall are of interest. He states as a result of his observations that (1) cancer of the cervix can be cured by the use of radium if it is treated early, (2) all cases presenting clinical symptoms should be treated with radium promptly because it is unsafe to await laboratory findings to confirm our diagnosis as delay may prove disastrous in such cases, (3) 58 per cent of cases of cancer of the cervix can be cured of they are treated before pain develops.

Effect of Ultra Violet Light on the Blood of New-Born Infants, Heyworth N. Sanford, M. D., Am. J. Dis. of Child., Jan., 1927.

With the increasing use of the ultra violet light as an important therapeutic measure in the treatment of children, Sanford attempted to ascertain the effect that this procedure has on the blood of the young organism. The material and method employed is noted. In the normal infant there is no direct relation between the number of platelets found and the age of the child. The platelets are evidently influenced in their fluctuations by circumstances not at present apparent.

In the infants receiving irradiation there is a decrease of one minute from the normal bleeding time. There was no change in the coagulation time.

Summarizing, it may be stated that short exposures to the ultra violet light lowers the bleeding time of the blood in the new-born infant but does not affect the coagulation time. The platelets are increased but not permanently so. Short exposures to the ultra violet light would serve as a therapeutic measure in infants with delayed bleeding time, but their coagulation time would have to be decreased by other measures.

Treatment of Extensive Tuberculosis with Ultra Violet Rays, Henry J. Gerstenberger, M. D., and Charles W. Burhans, M. D., Am. J. Dis. of Child., Jan., 1927.

Commenting on their studies, these authors write: "We are of the opinion that while the rest in bed, the completeness of the diet and the addition of cod liver oil were of value in improving the state of nutrition of the infants, they were not entirely responsible for the final successful outcome in these cases. We appreciate that no adequate proof can be given concerning this point, but it has been our impression in each of these cases that the exposure to the ultra violet rays was of value, especially in that it brought about a change of disposition in the patient, and that it made more consistent and more persistent the progress toward recovery, probably by enabling the human body, in some nonspecific manner, to be in a better condition to win its own fight against the disease. At any rate no demonstrable harm was done, and the improvement

occurred without the aid of outside air, sunshine or light spectra containing longer rays than those produced by the mercury quartz lamp, even though the lungs were extensively involved and the patients poorly nourished infants. Whether improvement could have been brought about sooner or later by the use of any or all of these other therapeutic measures of course, is another question which we are not prepared to answer at this time. The experience of Czerny, when he found that children when exposed to sunlight in closed glass verandas did not do as well as those who were exposed to sunlight in outside air, and did no better than other tubercular subjects housed in the ordinary fashion in the remainder of the hospital, probably corroborates our impression the the actinic rays, which in the patients treated in the glasshouse by Czerny were excluded from action, have a definite therapeutic value in cases of tuberculosis

"The experiences obtained with these cases force us to agree with Kleinschmidt, Epstein, Gravinghoff, Engel and others, that the clinical method suggested by Eliasberg and Neuland for differentiating between a tuberculous or a nontuberculous, massive, pulmonary infiltration is not satisfactory or dependable. Some of our cases went to the stage of cavitation; some did not. The cavities were all located in a dense rightupper lobe. We believe we are forced to accept, in the light of our present knowledge of the subject, that these at least were tuberculous in nature, and yet, as was stated earlier in this article, it does seem possible to us that even cavitation might represent a stage of a successful, specific, immunologic process or allergic reaction producible by certain types of human bodies in their fight against the tubercle bacillus.

"In scrofulous children, after an intracutaneous injection of tuberculin in a 1 : 1,000 dilution, we often have seen the development of a severe local tuberculin reaction, with marked infiltration and exudation of the skin with rather extensive necrosis in the center at times. On such a basis pulmonary lesions such as we have seen in our patients, and such as Eliasberg and Neuland and others describe, may be stages of one of the same process and belong to the group of lesions that some still persist in calling scrofulous."

The conclusions of these same writers are:

1. Tuberculous infants showing extensive pulmonary infiltration, even with cavity formation, may recover. Seven cases, covering an observation period of from one to two years, are reported.

2. It seems from the experience obtained in these infants that pulmonary exudates that are massive in character and lobar in distribution especially are inclined to improve. The relation of the lesions in our patients to the epituberculosis of Eliasberg and Neuland and the spleno-pneumonia of the French and Italian writers is discussed.

3. The question is raised whether the good results obtained in the type of cases reported is not due principally to the fact that such infiltrations are a part of a beneficial immunologic attack of the body against the tubercle bacillus, rather than that they are the results of the local success of the tubercle bacillus.

All of the reported patients in the cases were exposed at least three times a week to the quartz mercury arc lamp, and it is our impression that they are benefitted thereby. It is certain that no harm was done.

Roentgenography of the Cavity of the Uterus and Fallopian Tubes, with Special Reference to its Value in Cases of Sterility, Robert L. McCready, M. D., and Eric J. Ryan, M. D., Am. J. of R., Oct., 1926.

Roentgenography of the cavity of the uterus and fallopian tubes is discussed in great detail. Attention is directed to the report of several investigators who testify to the value of the use of the lipiodol in roentgenography of the cavity of the uterus and the tubes and to the harmlessness of the procedure. The technique is described and the importance of roentgenography in sterility discussed. Numerous illustrations appear throughout the report, and finally this summary:

1. Lipiodol is a very effective agent for roentgenography of the cavity of the uterus and the lumina of the fallopian tubes.

2. Roentgenography is a valuable addition to the diagnostic methods of the gynecologist.

3. Although interesting in other respects, the greatest practical value of the test is in determining the patency or position of occlusion of the fallopian tubes.

4. For obtaining accurate results with this test, stereo-roentgenography is essential and certain errors must be guarded against.

5. With the aid of this test, it is to be expected that much needed advances in the study of the relief of sterility due to occlusion of the fallopian tubes, will be made.

Accidents from Electricity, Sinclair Tousey, M. D., Internat. J. of Medicine and Surgery, April, 1927.

Accidents occur from the passage of electricity through some part of the body and only when the voltage is sufficient to overcome the resistance of the

tissues and when this voltage is combined with a harmful amperage or quantity.

Jellinek, who has had the greatest experiments in accidents from electricity has saved a man's life in an industrial accident by three hours' artificial respiration. He is sure that in most cases instantaneous death from electricity results from asphyxia and that many lives could be saved by this treatment. The effect of electricity seems instantaneous, but if the circumstances are such that the circuit is immediately broken the chances for survival are greatly increased as compared with allowing the prolonged passage of the current.

It is not so generally known as it should be, that the 110- or 220-volts house current may give one a fatal shock. This is especially true if the person manipulating the wires is grounded.

X ray apparatus always involves the use of sufficiently high voltage to give one very disagreeable shock. The modern powerful apparatus gives a current amply sufficient to cause death.

Voltages higher than 110 are dangerous under all circumstances and must be kept beyond the distance at which they might spark to the person; in other words, be so arranged that if a spark occurs it is not administered to the person. It should be emphasized that treatment of apparently instantaneous death from electric shock depends chiefly upon artificial respiration continued at least three hours before giving up hope.

Suggestions in Connection with the General Therapeutic Use of Physical Exercise and Mental Patients. Frank Albert Davis, M. D., Internat. J. of Medicine and Surgery, April, 1927.

As a therapeutic measure, the benefits of exercise will depend largely on the form in which it is prescribed and its method of administration. Passive exercise may be administered in connection with massage, and should be employed when voluntary effort is impossible or to be avoided. The best results from the therapeutic use of physical exercise are often obtained when the character of the exercise is such as to interest the patient.

Corrective exercises are frequently of distinct value in the treatment of certain forms of functional and organic nervous disease, when such conditions are accompanied by incoordination. This is particularly true with reference to certain forms of ataxia, some of the plegias and in certain cases of hysteria. Whereever incoordination exists, exercise therapy should be prescribed and faithfully carried out, even over long periods of time, with the ultimate objective of correcting the underlying pathology.

The methods of administering these exercises must be determined by the needs of the individual for whom they are prescribed, but strenuous and excessive exercise is to be avoided and rest is advisable so that body elimination may catch up with increased toxin produtions.

A weakened or infected myocardium may result if strenuous physical exercise is used in connection with infectious diseases such as tonsilitis or influenza. In cases of obesity, diabetes, gout and other forms of perverted metabolism, exercise, in conjunction with diet and other habit regulation, becomes a factor for important consideration, but must be prescribed and carried out under competent medical advice.

An important point to be remembered in connection with the therapeutic use of exercise is that fatigue must be avoided by those for whom it is prescribed; but the mistake must not be made of confounding fatigue with laziness.

In those suffering from cardiac diseises a carefully graduated system of exercises often produces good results. The question of when and to what degree those suffering from pulmonary tuberculosis may be allowed to exercise in connection with their treatment is one of vital importance. Experience has shown that better results occur from treatment when each case is individualized with reference to the progress of the disease.

In the treatment of psychotic and psycho-neurotic patients, the indication for the use of physical exercise, as well as to its character, is nearly the opposite to that which may safely be used in the treatment of tuberculous patients. Music and academic studies are useful for mental patients who find in them an appealing interest. All classes of mental patients require a certain amount of recreational activity. Certain forms of gymnasium apparatus are useful in the treatment of individual mental cases where special exercises are indicated, but this apparatus should invariably be of the stationary type. Walking is perhaps the nearest approach to a universal method of physical exercise. Mental patients who refuse to engage in other forms of activity are willing to walk.

The Efficiency of Fractional X Radiation, J. Douglas Morgan, M. D., Internat. J. of Medicine and Surgery, April, 1927.

Some eighteen months ago, while in charge of the x ray work at the Wm. L. Clark Hospital, in Philadelphia, Morgan changed his technic in the treatment of malignant neoplasms. The factors previously in use were 220 k. v., 4 M. A., 50 cm., distance, filters .75 mm. Cu. and 1 mm. Al., portals varying in size according to the requirements, and one or more of them as was indicated in each case. The time factor varied from one-half to one erythema dose per portal, and treatments were repeated in from four to six weeks. While the results with this technic were often satisfactory, there were a number of recognized objections. First of all, there was the danger of an overdose. With a full erythema dose any idiosyncrasy of the patient, or carelessness in the technic (such as the omission of the filter), was a matter of very great danger; secondly, there was always fatigue and discomfort associated with the prolonged treatments; thirdly, considerable systemic shock frequently followed; fourthly, in many cases x ray sickness occurred with resulting exhaustion;and fifthly, there were produced quite frequently, permanent pathological changes in the healthy tissues in the neighborhood of the neoplasm.

In the new technic the kilovolts, milliamperes, dis tance, and the filters remained as before, but Morgan began using the full size treatment cone (about 200 sq. cm.) with every case, and reduced the time factor very considerably, repeating the dose at frequent intervals for comparatively long periods. For cases where the malignant mass lies within 5 centimeters of the surface he treats it with doses of from three to five minutes twice daily for two weeks or three weeks. After an interval of two weks a second and later a third, and even a fourth series is given. When circumstances render it impossible for the patient to report twice a day the dose is reduced to one treatment, which is sometimes extended by the addition of a minute of two to the time. Similarly, for lesions lying deeper than 5 centimeters the time of exposure is increased and five or ten minutes are given twice daily over similar periods. No attempt is made to prevent overlapping of the portals of entry, but cross-fire radiations are used in order to reach the tumor from all sides and thus to obtain as uniform a radiation as possible. The likelihood of missing outlying metastatic nodules is greatly reduced by this method.

Other advantages of this technic are the following: The dangers of an overdose are enormously reduced; the fatigue of the long treatments is eliminated; radiation sickness is very rare; and the normal cells which surround the neoplasm are not permanently injured. Following these treatments, in addition to the morphological changes which occur in many of the malignant cells (vacuolation, karyolysis, and ultimate necrosis), there is an active round cell infiltration which replaces the destroyed cancer cells and which is subsequently changed into sclerotic connective tissue. If, however, large doses of irradiation are given to the tissues with the object of directly killing all the malignant cells, the effect is to produce a surrounding zone of necrotic tissue where healthy tissue should be, and this acts as a barrier against reparative processes. Morgan has observed, also, that when normal structures, such, for example, as the parotid gland, are exposed to these small doses, the resulting loss of function is only temporary, thus demonstrating that the normal cells are not permanently damaged as would be the case with heavy doses. The pain, when present, is greatly relieved soon after beginning treatment and a feeling of well-being is experienced in most cases. A diminution in the size and induration is frequently noticed even before a so-called erythema dose has been given.

These changes have been particularly striking in several cases which had previously receivel heavy radiation without apparent benefit. Indeed, these cases had all been going rapidly downhill, but showed an almost immediate (and quite startling) response to the small doses. It has been argued that the heavy doses were in reality responsible for the improvement but that their effects were delayed. It is, of course, difficult, if not impossible, to prove the contrary, but to those who followed the cases through there would seem to be no possible doubt but that their whole aspect changed very soon after the small doses were begun. Other workers have since reported similar interesting results. Thus, a few days ago, in Washington, Dr. Fricke, radiologist at the Howard Kelly Hospital in Baltimore, reported the surprisingly rapid disappearance of the tumor in a case of inoperable carcinoma of the stomach, and compared the results with a similar case which had previously been treated with heavy radiations and which had rapidly become toxic, and died. At the same meeting, too, Dr. Wm. Schmidt, of Philadelphia, reported several cases treated by fractional doses, and stated that he had been able to obtain better results with this method, particularly in cases involving the head and neck, than at any time previous to it use.

In an encouraging number of cases this beneficial effect has been continuous up to the present, although sufficient time has not yet gone by to draw final conclusions. In others, the cells have seemed to acquire a resisting quality. As was to be expected a "cure-all" dose has not yet been found.

The skin early shows a tanning which in some cases becomes quite marked. So far, however, the skin changes have gone no further and in the intervals between the various series of treatments much of the tanning has disappeared. Whether there will be a late appearance of those x ray cutaneous lesions which have sometimes occurred in the past, following prolonged irradiation, remains to be seen. That the small doses have a potency of their own has been amply demonstrated by the splendid results which have been obtained in cases which have received no previous irradiation, whether in a superficial lesion, such as carcinoma of the breast, or in deeply lying lesions in the pelvis and abdomen.

It is fully realized that perfection has not been attained as yet in the treatment of malignant growths with the x rays, but of such encouraging results can be obtained as have been done by the use of small fractional doses, are we justified in exposing our patients to the dangers and discomforts (both immediate and remote) of the longer treatments at present more generally in use?

Heliotherapy, Maurice Shapiro, M. D., J. of the M. S. of N. J., April, 1927.

The physics and physiology of heliotherapy are briefly reviewed. Two cases of tuberculous peritonitis are cited. Rest and supporting treatment were given with ultra violet radiations three times weekly for a period of two months. Improvement followed in this time and a cure in six months. The other case was in a girl of fourteen who had been operated upon. She had an unhealthy looking operative wound with three sinuses within two months and cure resulted from the use of ultra violet radiations.

Splendid results have been observed by Shapiro in neuresthenias, anemias and rheumatic joints. The gynecologist will find the rays of great aid in the treatment of tuberculosis of the pelvic region.

The field of dermatology has been most fruitful in good results from this therapy. Resistant chronic eczemas, psoriasis, lichen planus and urticaria have readily responded and impetigo has been cleared up by two or three treatments. Three cases of barbers' itch that were not influenced by ointments or even x rays, responded to the ultra violet light. In ringworm of the scalp the author prefers the light to x rays. While treatment takes longer, the alopecia that follows x ray treatment is avoided, the hair being normal when we are through. Alopecia aretoa responds readily to irritating doses from the water-cooled lamp. In port-wine marks and in nevi its results are wonderful. Acne yields to it and in lupus it is the remedy sine qua non.

Radium and Radon in Intra-Oral Cancer, Frank Edward Simpson, M. D., and Roy Emmert Flesher, M. D., Clinical Medicine, April, 1927.

The authors distinguish two types of patients, those in whom palliation only should be attempted and those in whom a strong effort should be made to bring about recovery. The authors have, furthermore, replaced the use of radium by radon a radio-active gas extracted from radium. There is one great difference between radium and radon. While radium tubes have always practically the same strength, radon tubes lose 16 per cent of their power every 24 hours. This loss must, of course, be taken into consideration when these tubes are used.

Methods other than irradiation of treating intra-oral lesions are discussed. Surgery, surgery combined with irradiation, and irradiation alone for lymph nodes of the neck are described. Several case reports are given. In conclusion the following is stated.

In the treatment of intra-oral cancer, at least 1,000 millicuries of radon should be available. A small quantity of radium or radon seldom cures the intra-oral lesion and is of little or no value in treating the lymph nodes.

One should use caution and judgement in the application of radon and in the implantation of radon tubes so that patients may be helped and not injured.

Treatment of Local Infections, William Benham Snow, M. D., Physical Therapeutics, Oct., 1026.

The conclusions of Snow are:

1. The relation of the host to the invader from within or without is such that the first indication for treatment of local infection is to fortify the part in vaded and destroy the invader.

2. The induction of active local hyperemia by modalities that heat the tissues and so, in response to normal reflexes, increase the circulation in the parts involved, coincidently depresses or destroys the germs present.

3. Under conditions of active hyperemia, nature's scavengers, the phagocytes, clear out the invading bacteria.

4. The modalities instrumental in the accomplishment include reflected radiant light and heat, dry hot air, diathermy with the direct d'Arsonvalization, x rays, and ultra violet rays.

5. Properly administered, these measures constitute most important means for coping with all types of local infection.

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